

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

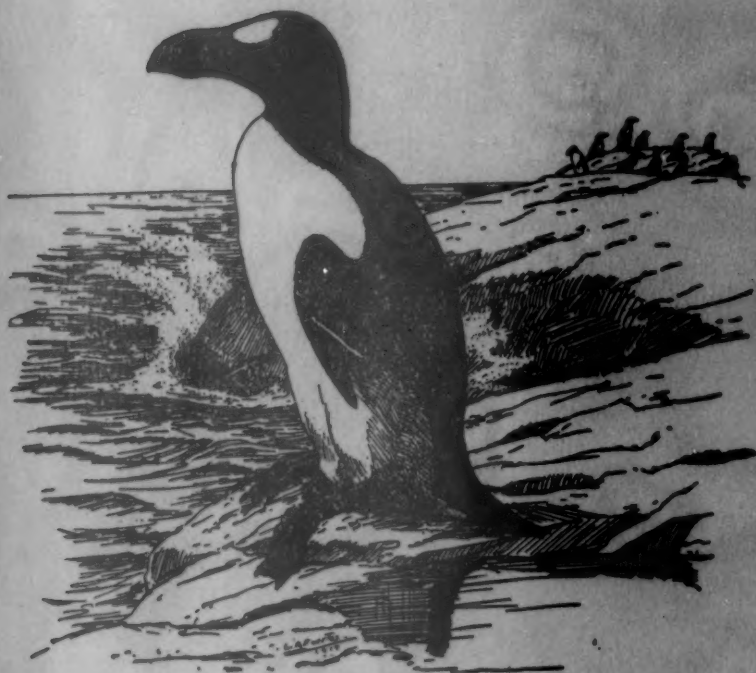
The Auk

A Quarterly Journal of Ornithology

Vol. 64

JULY, 1947

No. 3



PUBLISHED BY

The American Ornithologists' Union

LANCASTER, PA.

Entered as second-class mail matter in the Post Office at Lancaster, Pa.

Accepted for mailing at special rate of postage provided for in the Act of October 3, 1917, embodied in paragraph 4, section 538, P. L. and R., authorized May 15, 1938.

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(Upper) EDGE OF PLAINS 10 KILOMETERS SOUTH OF VILLAVIEJA, HUILA, COLOMBIA, SHOWING EROSION EXPOSURES AND PATCHES OF SCRUB COVER.

(Lower) SLOUGH AT VILLAVIEJA, SHOWING WOODLAND BORDERS INCLUDING BAMBOOS AND BANANAS.

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THE TROPICAL AVIFAUNA OF THE UPPER MAGDALENA VALLEY, COLOMBIA

BY ALDEN H. MILLER

Plates 12-13

THE arid tropical area of the upper Magdalena Valley of Colombia extends from Honda, Tolima, south through the departments of Tolima and Huila to about latitude 2° N., a distance of 375 kilometers (see Chapman, Bull. Amer. Mus. Nat. Hist., 36: 84 ff., pl. 26, 1917). This large district is unforested and its xerophilous vegetation reflects a greater extreme of aridity than does that of the floor of the Cauca Valley which lies to the westward on the other side of the central Andes. Along the main water courses in the upper Magdalena basin are strips of woodland with tracts of savanna adjacent to them, but in large measure the area is covered with open thorn scrub, sometimes forming a chaparral, yet often broken or scattered. Clumps of cacti are frequent and there are areas of short-grass plains and of barren, clay or gravel-surfaced badlands.

This arid basin is bounded on the east, south and west by the eastern and central divisions of the Andes on which the Subtropical and Temperate zones appear. Only at Andalucia in southeastern Huila is there a moderately low gap leading eastward through the encircling mountains. This gap is stated by Chapman to be 7000 feet in elevation; it lies in the Subtropical Zone. The Tropical Zone occurs below about 5000 feet. To the north the upper Magdalena Valley adjoins the more humid middle section of the Magdalena drainage which, by reason of its climate and forests, forms a varyingly effective ecologic barrier between the biota of the arid upper region and that of the moderately arid Caribbean coast.

Chapman's report (*op. cit.*) on the bird life of Colombia dealt much more fully with the fauna of the arid tropical Cauca district than with

that of the upper Magdalena. He stated (p. 124) "that our work has been done about the borders of the upper Magdalena district. Of the fauna of the floor of the valley, I feel that we have still much to learn." More specifically, Chapman's parties worked at Honda, in a narrow part of the valley, where the arid tropical fauna is not typically developed, and at Chicoral, near Giradot. Even at Giradot the full measure of aridity is not encountered. In travelling south from this point, it may be seen that woodlands become more restricted, savannas more open and the grass shorter; scrub, open plains and badlands predominate. Chapman's parties also worked at San Agustín at the head of the valley at 5000 feet in the upper edge of the Tropical Zone, and below Andalucia at 3000 feet near the margin of the tropical area. Neither of these southern stations may be depended upon to afford an adequate representation of the fauna of the valley floor. A very few native-made skins were available to Chapman from Purificación, 50 kilometers south of Giradot.

In January and February of 1945 I had opportunity to collect and observe birds intensively at Villavieja, Huila, at an elevation of 435 meters (1427 feet), 30 kilometers north of Neiva. This is in the middle of the arid tropical district and represents its most extreme manifestation. Through the kindness of Dr. R. A. Stirton, I shared his quarters at Villavieja, where he was engaged in collecting fossils in the late Miocene beds of the near-by badlands; Stirton also in many other ways aided and encouraged my work in Colombia. I am further indebted to the Servicio Geológica of Colombia, to the Tropical Oil Company, and particularly to Dr. J. Wyatt Durham of that company, who generously gave various critical assistance to Dr. Stirton and to me. I was able to work uninterruptedly at Villavieja from January 12 to February 11, spending half of each day hunting and observing in the field. A total of 380 birds was taken; also there were six specimens taken by Stirton in near-by areas in Huila and Tolima. The specimens represent 123 species. Additionally seven species were identified adequately by sight so that 130 species may be recorded from Villavieja. In the summer of 1946 identifications were reviewed and critical specimens were compared directly with Chapman's and other collections at the American Museum of Natural History. I am much indebted to John T. Zimmer for the use of the Museum's facilities and for aid in taxonomic problems relating to South American birds.

A variety of habitats was accessible at Villavieja. About five kilometers northeast along Quebrada La Venta lay the large area of barren land where some of the best fossil exposures occurred. The

ground surface here was chiefly blue or brown clay, but in some areas the surface was covered with a residue of Pleistocene cobbles and gravel. There was little or no grass. Small mimosa bushes grew scatteringly in the intermittent water courses. South and east of town, six to ten kilometers, a short-grass plain could be reached. On this were several small, shallow playas, some with borders of tall grass, thorny brush and cactus (Plate 13, lower figure). The thorn scrub nearer town varied in height from three to 18 feet. Much of it could be traversed easily, but occasionally tracts of an acre or more proved impenetrable. Grass two feet in height was intermixed with the scrub. Closer to the river were bottomlands with open savannas with trees 15 to 30 feet tall, 50 to 150 feet apart, and with waist-high grass, except where it was overgrazed. In the Laja Valley, three kilometers northeast, a tributary of the Magdalena, there was a merging of thorn scrub and streamside woodland. The latter was often 60 feet in height and usually only 300 feet wide (Plate 13, upper figure). The woodland along the Magdalena River itself was somewhat less xerophilous and even taller than that of the Laja Valley. Tall bamboo clumps were frequent. Probably originally these woods were in places two kilometers across, but they were rather thoroughly broken up by pasture lots and small plantations of corn and bananas so that they usually consisted of narrow borders of trees. Just south of Villavieja was a slough two kilometers in length, the lower course of a small tributary, which had little flow and was overhung by trees. The water was choked with floating vegetation except for a narrow central channel (Plate 12, lower figure). This situation was particularly favorable for the naturalist, for the slough was attractive to marsh birds and by wading in it the species of the woodland borders were readily accessible. The Magdalena River was swift-flowing, with loose rock bottom in many places and with steep, muddy banks.

In the accounts of species which follow, taxonomic and distributional matters are included where new information has come to light, but primarily attention is devoted to observations on habitat and to fragmentary records of behavior, items which are particularly lacking for many South American birds. Data on sexual activity and weight are for similar reasons included. The breeding cycles of birds in equatorial regions are but poorly known. Specimens were taken within five kilometers of Villavieja and in 1945 unless otherwise noted. Some specimens saved as alcoholics or as skeletons were not weighed, and alcoholics were not sexed. Age has been determined from the condition of the skull unless otherwise stated.

Anhinga anhinga leucogaster (Vieillot).—Encountered but once, when one was taken as it was perched on a post standing in a muddy section of the slough where there were broad borders of water vegetation. The bird was fully exposed, as there was no foliage screen. When first seen, it was standing with wings outspread, possibly in preparation for flight. I follow Wetmore (Proc. U. S. Nat. Mus., 93: 232-233, 1943) with respect to the racial taxonomy of this species.

♂, February 3, wing 338 mm., tail 264, culmen 97.

Ardea cocoi Linnaeus.—One was seen flying along a wooded section of the Magdalena River on January 24.

Butorides striatus striatus (Linnaeus).—Of regular occurrence along river courses and sloughs and about ponds on the plateau. The adherence of these herons to foliage-screened borders, the character of their notes and their behavior in every way suggested the closely related Green Heron, *Butorides virescens*, of North and Central America.

♂, January 31, 163 gm., testis 7 mm., iris and face yellow; ♀, first-year, February 2, 10 km. S. Villavieja, 135 gm.

Theristicus caudatus (Boddaert).—These ibises proved to be fairly common on the plains and in the badlands where they worked along muddy stream banks, about playa lakes, in dry short grass, and well out on the stony slopes and mesas. In feeding they picked objects from the surface and did no probing or stone-turning. Often they were associated in pairs. Once two birds alighted in the top of a twenty-five foot tree after they were flushed from the ground. At times they flew high overhead, calling, often at such heights that their markings could not be made out. Chapman did not record this species in the Magdalena Valley.

♂, February 1, bare skin of face black, iris and feet red; ♀, same data; immature ♂, 10 km. S. Villavieja, February 8, iris dark, feet pink.

Anas discors Linnaeus.—A flock of about 50 frequented two shallow ponds on the plateau 10 kilometers south of Villavieja. These ponds were each about two acres in extent, well grown with water vegetation and bordered with some low thorn trees; they nowhere were more than two feet deep. Few male teals in nuptial plumage were noted.

♀, February 2.

Coragyps atratus (Bechstein).—Common about towns and dwellings and along the river.

Cathartes aura (Linnaeus).—Seen often in the open scrub country, soaring about the mesas and escarpments. In a small side valley, on January 18, an adult flushed from a nest when I fired into a tangle of trees and thorny bushes. The clump of vegetation was about 75 feet across, and near its middle was a boulder five feet high. Beside the rock, partly protected above by an overhang, was a single vulture egg on bare earth from which leaves had been cleared. The nest was clean, but immediately flies settled on the egg. Fifty yards away the adult sat on a low bluff, craning its neck. On January 23 an adult was covering the nest closely and had to be pushed off. The single egg had hatched and the young one gave a loud hiss. I judged it to be only about a day old; half egg shells were in the nest. Flies immediately swarmed on the young bird's head. The parent feigned injury, beating through the brush 15 feet away. On February 4 the adult flushed before I entered the thicket. The young was then the size of an adult Screech Owl and sat upright on its haunches, hissing.

Heterospizias meridionalis meridionalis (Latham).—These hawks, which behave and on the wing look like buteonines, especially rough-legs, were encountered regularly

on the plains south of Villavieja. They seemed confined to open grasslands and to borders of playas where they sat about in the occasional thorn trees or on organpipe cacti. One of the birds taken near a pond had remains of about six small toads in its gullet. This species was not reported by Chapman from Colombia.

♂, January 17, 6 km. SE. Villavieja; ♂, February 2, 10 km. S. Villavieja; ♀, February 8, 10 km. S. Villavieja.

Buteo magnirostris magnirostris (Gmelin).—An abundant and very tame hawk in the streamside forests and also in the moderately open scrub. Its sapsucker-like squalls sounded through much of the day in the woodlands.

♂, October 18, 1944, Carmen de Apicala, 400 m., Tolima, iris, cere and feet yellow; ♂, January 16, iris and feet yellow; ♀, January 21.

Geranospiza caerulescens caerulescens (Vieillot).—Twice encountered, on both occasions in bottomland where woods and tall grass were mixed. The wing beat is slow, but not labored.

This form was not reported from the country by Chapman; its occurrence west of the eastern Andes is significant, since Peters's (Birds World, 1: 268, 1931) statement of range is not explicit in this regard. The skin, which was saved, shows distinct, widely spaced cross-bars of white on the under parts and in this respect, as well as in light gray color, it agrees with *G. c. caerulescens* rather than with *G. c. balzarensis*. Wetmore (Proc. U. S. Nat. Mus., 87: 186, 1939) maintains three species in this genus, but no reasons for this are given other than strong differentiation in color and pattern. In the material I have seen at the American Museum, all the species distinctions he gives are fairly well broken down by individual variation. It seems likely that full intergradation occurs (see also Peters, Proc. Biol. Soc. Wash., 48: 71, 1935); the forms are geographically complementary so far as known.

♀, January 31; ♀, February 2, 10 km. S. Villavieja.

Herpetotheres cachinnans (Linnaeus).—Two were noted on January 15 as they perched in the top of an exposed tree in scrub-covered terrain. They occasionally gave single notes of moderate intensity.

Milvago chimachima cordatus Bangs and Penard.—These small caracaras were abundant and of wide ecologic range. They were seen in the densest woods, in thorn brush and out on the open plains. Several groups of young were seen, which had but recently left the nest (January 19, 20, 21); such groups proved easy to detect by the continual yelping of the young; wheezing notes were heard from adults. One adult had corn kernels in the stomach. This species was attacked vigorously by Fork-tailed Flycatchers on one occasion.

♀ im., November 18, 1944, Coyaima, 450 m., Tolima, iris brown; ♂ im., January 14; ♂ im., January 18; ♀ ad., January 27; ♀ ad., February 6.

Polyborus cheriway cheriway (Jacquin).—Much less numerous than the small caracara, *Milvago chimachima*. On January 13 one perched on a large organpipe cactus and repeatedly gave a low rattling note as it threw its head up and backward. After the bird was shot, another individual flew to the same spot and gave the performance. The bird that was taken was not particularly active sexually; it was heavily infested with mallophaga.

♂, January 13, skin of body and face bright yellow; ♂, January 17, 6 km. SE. Villavieja.

Falco fusco-coerulescens fusco-coerulescens Vieillot.—This species was seen in open thorn scrub, although it at times ranged into adjoining streamside borders. The birds usually were seen perched on tops of organpipe cacti along the base of a rocky hill. One taken here had small chunks of bird meat in the crop.

♂, first year, January 26, 218 gm., testis 4 mm., iris dark; ♂, ad., February 1, 235 gm., testis 5 mm., iris dark.

Falco sparverius intermedius (Cory).—Seen frequently in open country. Two birds, apparently mated, were taken from the same section of a telephone line.

♀, November 20, 1944, Coyaima, 450 m., Tolima; ♂, January 24, 95 gm., testis 6 mm.; ♀, January 24, 108 gm.

Ortalis columbiana columbiana Hellmayr.—Found only in the Lajas Valley, where there was but sparse human settlement. Calling groups were twice encountered in tall, irregular scrub growth, 20 feet in maximum height, and once in heavy stream-side forest. On one occasion, at least six birds were present. They flew from one clump of trees to another, with labored, slow wing beat; usually they moved in couples. In preparing a specimen, the tracheal loop was seen to extend over the breast muscle to the posterior end of the sternum, the two limbs of the loop lying on either side of the carina. The rich strawberry red of the throat faded to dull pink within three hours.

This form is doubtfully conspecific with *O. guttata*. It contrasts strikingly in shape and markings of breast feathers and in size with an example of *O. guttata* at hand from Perú. Accordingly, I follow Peters's (Birds World, 2: 18, 1934) classification of these birds rather than that of Hellmayr and Conover [Field Mus. Nat. Hist., Zool. Ser., 13 (pt. 1), no. 1: 166, 1942].

♂, January 16, testis 12 mm.

Colinus cristatus leucotis (Gould).—Abundant in grassland, except where the grass was very short on the plains or where it was heavily grazed. Grass two feet high and where mixed with clumps of bushes seemed to support the greatest numbers. Males commonly called from bushes or from trees along the fence rows. The three-parted bob-white note seemed not to differ from that of more northern species of the genus.

The specimens from Villavieja agree fairly well with material from Honda, which locality has been designated the restricted type locality of this form. However, as a group they show a little more extreme pallor on the crest and forehead than do topotypes.

Two females and a male which I took 25 kilometers west (by road) of Leiva, Boyacá (120 km. NNE. Bogotá), 2500 meters, are evidently *bogotensis*. They agree well with Dugand's excellent description (Caldasia, 2: 194-198, 1943); however, I have not been able to make a direct comparison with topotypes. Dugand (*op. cit.*; Caldasia, 2: 202, 1943) indicates that *bogotensis* intergrades with *leucotis* at San Gil, Santander (specimens closer to *leucotis*), and at Boitá, 60 kilometers north of Bogotá (specimens closer to *bogotensis*). A specimen from El Carmen, 80 kilometers NNE. Bogotá, may not in fact be *leucotis* as reported by Chapman. I cannot be sure that my specimens from the Leiva area depart at all from *bogotensis* in the direction of *leucotis*. The throat of the male is dark reddish and black and the crown and crest are blackish. In general the dorsal dark areas are more extensive and blacker than in *leucotis*, with which the birds strongly contrast.

♂, January 15, 140 gm., testis 7 mm.; ♀, January 16, 127 gm.; ♂, January 26, 152 gm., testis 10 mm.; ♂, January 26, 152 gm., testis 10 mm.; ♂, January 26, 132 gm., testis 8 mm.; ♂, January 28, 142 gm., testis 8 mm.

Aramides cajanea cajanea (P. L. S. Müller).—This rail was widespread in the region and was not confined to marshes or sloughs. Occasionally it was seen there, but more often it was noted along the banks of intermittent stream courses, taking off, usually afoot, into the tall grass borders or through the undergrowth of the woodland.

When first met, on January 13, it was found in an area grown to opuntia and organ-pipe cacti with scattered patches of waist-high bushes; the ground surface was a hard gravel pavement and there was no watercourse within half a mile. Two birds were seen running among the bushes and one was taken, a juvenile, but fully grown. The other bird, an adult, circled in the bushes near me, giving a guttural chuckle. Finally it was taken when its bright yellow bill showed through the foliage screen; it was a male.

Birds from the upper Magdalena and Cauca valleys are paler on the neck and duller green dorsally than most other wood-rails of this species from northern South America. However, similarly colored birds occur in other parts of South America and even in the Guianas whence this form was named. There appears to be too imperfect a correlation of color type and geographic area to warrant recognition of continental races of this species south of Panamá.

♂ ju., January 13, feet dull orange, bill yellow horn, iris brown; ♂ ad., January 13, feet carmine, bill yellow, iris and eyelids dull red (same in subsequent specimens); ♂, January 20, testis 15 mm.; ♀, February 3; ♀, February 6.

Porphyryla martinica (Linnaeus).—On February 5 two were flushed from floating vegetation along the border of the slough. The one taken was an immature bird with a scattering of purple feathers on the neck and flanks.

♀, February 5, 179 gm.

Jacana jacana hypomelaena (Sclater).—Jaçanas were scattered along the slough, working on the surface of the dense water vegetation where the water ranged to three feet in depth. The birds were grouped in pairs. One pair showed sign of nesting on February 3, becoming much excited by my presence; a female which was taken on January 31 had yellow ova 4 mm. in diameter, and her mate was in breeding condition. Fully grown young were seen on February 5 in the same area. Jaçanas also were seen at a pond on the plains on February 2 and 8. Here they were in small flocks numbering up to five individuals. It seems to me that Wetmore (Proc. U. S. Nat. Mus., 87: 191, 1939) is correct in maintaining *J. jacana* and *J. spinosa* as distinct species. I have seen no evidence of intergradation among adults in the characters of the frontal shield and rictal wattles.

♀, January 31, 145 gm., moderately fat, wattles red, anterior bill and spine of wing rich yellow, feet green, iris dark; ♂, January 31, 80 gm., no fat, colors as in ♀; ♀, February 3, 150 gm.; ♂, February 7, 92 gm., testis 18 mm., brood patch.

Belonopterus chilensis cayennensis (Gmelin).—Found in the plains region southeast of Villavieja, where on January 17 about six individuals were noted. They frequented both dry ground and the muddy edges of small ponds. This species is remarkably tough-skinned and the flesh is likewise tough. Locally the species is called "Tonga."

3 ♂♂, January 17, 6 km. SE. Villavieja, testes 4 mm.

Charadrius vociferus Linnaeus.—Single birds were detected on February 2 and February 8 in the course of visits to the ponds 10 kilometers south of Villavieja.

Totanus flavipes (Gmelin).—Small groups, numbering up to six, were seen about the ponds on the plains 10 kilometers south of Villavieja on February 2 and 8.

♂, February 2, 80 gm., testis 4 mm.; ♂, February 8, 84 gm.; ♂, February 8, 89 gm.

Totanus melanoleucus (Gmelin).—A few individuals of this species were associated with *T. flavipes* on February 8 at the ponds south of Villavieja.

Tringa solitaria solitaria Wilson.—This sandpiper was the most numerous shore-bird in the region. Single individuals appeared at isolated puddles along otherwise dry stream courses, at slough and river margins, and about playas on the plains.

All specimens are referable to the eastern race on the basis of characters ascertained by Taverner (Condor, 42: 215, 1940).

♂, January 17, 45 gm., testis 1 mm.; ♂, January 20, 44 gm., testis 1 mm.; ♀, January 30, 50 gm., ovary inactive; ♂, February 2, 10 km. S. Villavieja, 44 gm., testis 2 mm.

Actitis macularia (Linnaeus).—Only once detected, when a bird was taken at the slough on February 7. This individual, an immature, was undergoing a molt of the primaries and secondaries. Only the outermost old primary is present in each wing. A single fully grown black-spotted feather occurs on the otherwise immaculate breast.

♂, February 7, 33 gm.

Capella delicata (Ord.).—Snipe were occasionally flushed from the grassy borders of the ponds on the plains 10 kilometers south of Villavieja. All taken are of this North American species and are typical of it in the significant characters of width of outer tail feather and size of bill.

♂, February 8, 105 gm., fat, testis 4 mm.; ♂, February 8, 125 gm., excessively fat, testis 3 mm.; ♂, February 8, 105 gm., little fat, testis 2 mm.

Burhinus bistriatus vocifer (L'Herminier).—These birds did not frequent the wet places but were found in short-grass plains and on the rocky hill slopes and mesas in the badlands. The birds occurred in pairs or solitarily. Once when a pair was encountered and when one was shot, the mate stayed close by, although it had in no way been injured. The female of this pair had ova 5 mm. in diameter and was thus soon to lay.

Thick-knees were at times seen crouching on the ground; possibly many escape detection in this way. In flight they somewhat suggested large Willets, but most of the time they were silent. This species, like *Belonopterus*, is exceedingly tough-skinned, and the flesh is almost inedible because of toughness.

♂, January 17, 6 km. SE. Villavieja, testis 10 mm.; ♀, February 2, 10 km. S. Villavieja, ova 5 mm.; ♂, 10 km. S. Villavieja; ♂, February 9, iris yellow.

Zenaidura macroura stenuata (Bonaparte).—Extremely abundant in open scrub and about fields. At times flocks of fifty to one hundred congregated in fence-row trees. These doves fed on the ground much as do Mourning Doves.

♂, January 30, 120 gm., testis 13 mm.; ♂, January 30, 102 gm., testis inactive; ♂, February 4, 112 gm., testis 10 mm.; ♂, February 4, 110 gm., testis 8 mm.; ♂, 125 gm., testis 14 mm.

Columbigallina passerina parvula (Todd).—Abundant in the thorn scrub and about town. Scattered groups or pairs were flushed from trailways and roads every few yards as one passed along them. No nests were noted, but birds that were taken indicated readiness to breed. In the central plaza in Neiva, on January 12, Stirton and I watched two individuals fight in the presence of a third bird. The combatants flew up from the ground, vertically for three feet, and struck at each other with their wings. This was done at least three times. Between flights the birds crouched on the ground, rapidly flitting their wings.

♀, January 16, 32 gm.; ♂, January 24, 32 gm., testis 8 mm.; ♂, February 5, 32 gm., testis 10 mm.

Columbigallina talpacoti rufipennis (Bonaparte).—Not as common as *C. passerina*, yet seen frequently along trails in the thorn scrub.

♀, January 23, 45 gm.

Leptotila verreauxi verreauxi (Bonaparte).—Encountered in the thicker scrub, often under the bushes; also seen in woodland. One taken on January 14 was emaciated and apparently too weak to fly.

♀, January 14, 93 gm., thin, feet red, face blue; ♀, February 1.

Aratinga wagleri wagleri (G. R. Gray).—These extremely loud-voiced parrots flew overhead daily in bands numbering up to seventy. Only once were they seen at close range when a group of four stopped in a small tree at the edge of the woods after flying across the badlands.

♀, February 1, 162 gm., ova 2 mm.

Forpus conspicillatus conspicillatus (Lafresnaye).—This small paroquet was abundant in open woods and in thorn bushes even where these were widely spaced in the badlands. Flocks feeding in the trees suggested crossbills in their deliberate movements as also in their rapid departure by dropping steeply in their take-off. The flocking twitter resembled somewhat that of Tree Swallows. Pairs were often seen prospecting for nests about dead stubs and fence posts. On January 26 a female was flushed from a hole in a stub five feet from the ground. Twenty inches down were four white eggs, about one-third incubated; one was addled. The bottom of the cavity was covered with large rough chips of wood and there were a few feathers. The hole was not excavated but was irregular in shape and had rotted out. On January 27 another paroquet was flushed at close range from a nest hole in a fence post; this nest was not opened up. The hole was in the top of the post and the wood surrounding it was firm.

♀, January 13, 27 gm.; ♂, January 15, 26 gm., testis 4 mm.; ♂, January 19, 27 gm., testis 3 mm.; ♀, January 19, oviduct enlarged, mate of preceding male; ♂, February 7, 24 gm., testis 3 mm.; ♂, February 7.

Brotoeris jugularis jugularis (P. L. S. Müller).—Noted in the woodlands along stream courses, often in pairs but also at times in flocks of twenty or more individuals. A mated pair taken on January 27 showed no sign of breeding activity.

Our specimens do not differ from central American examples of this race and suggest no approach to *B. j. cyanoptera*.

♀, January 23, 54 gm.; ♂, January 23; ♀, January 27, 51 gm., ovary inactive; ♂, January 27, 58 gm., testis 2 mm.; ♂, February 3, 59 gm., testis 2 mm.

Amazona ochrocephala panamensis (Cabanis).—These parrots almost always were stationed in the crowns of large trees along the river bank. A favored kind of tree was one that rose to heights of one hundred feet or more and bore conspicuous, large orange flowers. The Amazonas moved from crown to crown, characteristically in twos, and occasionally were seen in long flights across the open country. Their flight, in its steadiness and rate of wing beat, is remindful of that of a duck. In the distance their notes sounded like a group of crows. On January 25 three individuals came into some low trees along a fence on the crest of a hill.

♀, January 25.

Coccyzus melacoryphus Vieillot.—This was a common bird of the borders of grassy pastures, frequenting the fence-row trees and scattered thorn bushes. In the early morning these cuckoos sun themselves as anis do, with tail spread and wings partly spread and drooped. They have a weak Road-runner-like song consisting of half a dozen, downwardly inflected cooing notes. This was seldom heard, perhaps because few if any of the birds were breeding. All birds that were taken were young or were adults inactive sexually, and all were molting.

♀, January 14, 45 gm.; ♀, January 15, 44 gm.; ♂, January 15, 47 gm.; ♂, January 24, 45 gm.; sex?, January 30, 45 gm.

Crotophaga major Gmelin.—Found only along the borders of the slough where they were seen in trees overhanging the water and in the edges of the tall grass near the water. This species is gregarious like its smaller, widespread relative, *C. sulcirostris*.

Several times groups of three or four were seen perched facing each other uttering a rasping, snarling chorus of notes. A harsh squawk, like that of a Black-crowned Night Heron, was also heard. The white iris of this species is conspicuous at a distance. On February 7, one was seen carrying nesting material.

♂, February 5, 165 gm., testis 13 mm.; ♀, February 5, 156 gm.

Crotophaga sulcirostris sulcirostris Swainson.—Abundant and of wide ecologic range. Especially numerous in savannas. The densest woodlands were seldom entered and the open plains and badlands were unoccupied. On January 13 a nest with two eggs was found in a small isolated thorn tree in a grassy field. Two adults were in attendance. No other nests were noted and it is thought that few anis were actually breeding at this season. In the early morning, sunning was conspicuous, the birds sprawling on the tops of bushes with wings and tail spread. On January 14, anis became much concerned over the presence of a wounded *Buteo magnirostris*. The three anis taken on January 15 were perched so close together that they were taken with one shot; they were quiet and showed no aggressive behavior, although all were approaching breeding condition. Several other individuals were perched near by. Chapman listed specimens of this wide-ranging species under *C. ani*; one such specimen was a bird from Chicoral.

♂, January 15, testis 5 mm.; ♂, January 15, 75 gm., testis 5 mm.; ♀, January 15, 69 gm., yellow ova; ♂, January 26, 70 gm., testis 7 mm.; ♂, January 26, testis 5 mm.; sex?, January 30, 73 gm.

Tapera naevia naevia (Linnaeus).—The piercing but ventriloquial three-parted songs of this cuckoo were heard in open brush mixed with grass. The notes carry for at least a quarter of a mile. The birds proved shy and seldom were seen except as they flushed at a distance from a song perch. One such perch was but three feet above the ground.

♂, January 14, 54 gm., testis 4 mm.; ♂, January 19.

Tyto alba (Scopoli).—Heard occasionally at night in the vicinity of the town.

Otus choliba crucigerus (Spix).—On January 25 while I was walking beside a fence, an owl of this species flushed from a nest hole in the top of a post. The cavity opened straight up; 15 inches down were two young owls on the floor of the cavity. The young were well feathered, although still heavily covered with down. The young had a number of warbles, and the smallest bird was so infested in one wing, that there was some disturbance of the growth of the primaries. The adult flew off into a thorn thicket 75 feet down slope where it assumed the elongated "alarm" pose, with ear tufts erect. The stomachs of adult and young contained insect matter, orthopterons primarily; in one there was a trace of hair.

The adult specimens seem to differ in no way from the lowland race, *crucigerus*, of widespread occurrence in northern South America. Individual variation is extremely great in this species. One of the adults is in gray phase, the other in moderately red phase.

♀, Coyaima, 450 m., Tolima, November 20, 1944; ♀ ju., January 25, 120 gm.; ♂ ju., January 25, 108 gm., iris yellow; ♀ ad., January 25, 140 gm., iris yellow.

Speotyto cunicularia tolimae Stone.—Fairly numerous in the badlands district. On January 19 a group of owls was found about a burrow in the edge of a gully. The hole was 8 inches in diameter and the floor clean except for a large green elytron of a beetle. The adult female was sitting in the entrance; the adult male, which looked much paler, appeared across the gully. A single fully grown juvenile was taken near by. All three birds were in worn plumage and were molting.

In contrast, with respect to breeding cycle and molt, were two fresh-plumaged

birds, a pair, taken on January 23 at a nest hole. This burrow also was at the edge of a gully on a grassy shoulder where the ground began sloping away steeply. The floor of the burrow was well lined with horse dung two feet down. The hole swung to the left in a half circle and maintained its initial diameter of six inches. Eight feet in it terminated in a nest chamber 21 inches below the surface and only three feet from the entrance point. There was no dung in the enlarged nest cavity. Three heavily incubated eggs constituted the clutch. I suspect that the burrows are dug by the owls, as there are no large burrowing rodents in evidence in the area; the soil is soft and somewhat sandy.

This race of *Speotyto cunicularia* does not impress me as being dark to the degree described by Stone (Proc. Acad. Nat. Sci. Phila.: 303, 1899). The upper parts are as deep brown as those of *S. c. floridana* and *rostrata* and are darker than those of any *hypugaea* or *S. c. cunicularia*. However, the dorsal spots are purer white than Stone's description would indicate and are like those in *floridana*. The under parts are variable in pallor; all are much paler than *floridana* and some have larger pure white areas than *hypugaea*. The white of the tail is much as described by Stone. Wing length ranges from 158 to 172 mm., all somewhat in excess of the six-inch wing length given by Stone.

♂, Coyaima, 450 m., Tolima, November 10, 1944, iris yellow; ♀ juv., January 19, 92 gm.; ♂, January 19, 122 gm., testis 5 mm.; ♀, January 19, 123 gm.; ♂, January 23, 123 gm., testis 8 mm.; ♀, January 23.

Nyctibius griseus panamensis Ridgway.—On February 9 Stirton encountered one of these birds perched erectly in a dense streamside forest tangle. The specimen agrees in size and wing markings with *panamensis*. It is similar in all respects to a bird from Antioquia in the American Museum; both fall among the paler variants of this race.

♀, February 9, 177 gm., ovary inactive, iris yellow.

Chordeiles acutipennis acutipennis (Hermann).—Near town in an area of grassy pasture and scattered brush were a few small patches of gravel on elevated ground. These nighthawks were conspicuously limited to these localities. On January 21, after dark, one flew about one of these patches, diving shallowly and uttering the twanging note typical of the nuptial performance of this species (Miller, Condor, 39, 42: 1937). At other times it was heard, apparently on the ground, giving the guttural trill. These notes were typical for the species as known to me in North America, except that the trill seemed distinctly higher in pitch. This is perhaps to be expected in view of the extremely small size of this race. The bird that was calling proved to be a sexually active male. No nighthawks of this species were seen in daylight hours.

♂, January 21, 39 gm., testis 5 mm.

Podager nacunda minor Cory.—One of these striking white-bellied nighthawks flushed from under foot on a gravelly ridge in the badlands on January 23. It flew 30 yards and lit on the ground, then bobbed up and down. The ovary of this bird showed one empty follicle and no especially enlarged ova. Probably there was a nest which we failed to find, and it would appear that only one egg had been laid. The bird was exceedingly fat.

Sex? (male plumage), Coyaima, 450 m., Tolima, November 20, 1944; ♀, January 23, 162 gm.

Nyctidromus albigollis albigollis Gmelin.—Abundant in the vicinity of town. After dark six could often be heard at a time, giving their rather harsh, strongly accented calls. The form and quality of the note varied greatly, but apparently only the one species was involved. In grassy pastures they stayed near larger thorn

thickets, usually perching by dark above ground; they were shy in the beam of the flashlight. Twice birds were flushed by day, once deep within a thorn thicket and again in dark woods along a damp stream course. These birds had been resting on leaf litter. The pauraques evidently were breeding, yet all were molting.

♂, January 19, 60 gm., testis 17 mm.; ♂, January 21, 55 gm., testis 14 mm.; ♀, January 24, 58 gm., ovum 4 mm.

Streptoprocne zonaris albicincta (Cabanis).—Usually these swifts were seen in large numbers. They could be detected almost daily, but on some occasions, especially in windy and cloudy weather, they swung low over the fields and 50 or more could be counted at a time.

♂, January 27, 83 gm., testis 6 mm.

Anthracothonax nigricollis nigricollis (Vieillot).—On January 22 one of these hummingbirds was shot down from the crown of a flowering tree on the river bank. On January 29, the species was noted about a tree in a grassy field. The top of this isolated tree was dead, and the birds came to perch on the exposed twigs, apparently using them as lookouts. No noises were made, nor were insects captured, but the birds often looked about. Only one bird perched here at a time, although there were three males taken from the tree in a period of 15 minutes. Once there was a chase, then a return past the tree in bounding flight in the form of a horizontal figure eight. Some vocal notes accompanied this display.

♂, January 22, 7 gm., testis 5 mm.; ♂, January 29, 7 gm., testis 3 mm.; ♂, January 29, 7 gm., testis 3 mm.; ♂, January 29, 7 gm., testis 3 mm.

Chrysolampis mosquitus (Linnaeus).—Seen congregated about large flowering trees on the banks of the river. All taken were young males with a narrow stripe of metallic feathers on the throat.

2 ♂♂, January 22, testis $\frac{1}{2}$ mm.; ♂, February 7.

Lepidopyga goudoti goudoti (Bourcier).—This hummer typically works about among twigs of trees, beneath or within their crowns, probably in search for insects. It was not seen visiting flowers. One was taken in forest understory near a stream and many were noted about mimosas standing in the open, where they moved slowly through the twigs beneath the umbrella-like tops of these small trees.

♂, January 14, testis 2 mm.; ♂, January 22, testis $2\frac{1}{2}$ mm.; ♂, January 29, testis $\frac{1}{2}$ mm.

Megaceryle torquata torquata (Linnaeus).—This kingfisher was seen along the banks of the Magdalena River occasionally and also along the slough. It seemed to select perches high in the trees. Two came into a fifty-foot dead tree near the slough and gave harsh sputtering notes, the elements of which were more spaced and less loud than in *Megaceryle alcyon*. This species was more wary than the members of the genus *Chloroceryle*.

♂, January 22, testis 5 mm.; ♂, February 5, testis 9 mm.

Chloroceryle amazona mexicana Brodkorb.—One was taken on a section of the slough where the water was clear and flowing slowly over rocks for a distance of 50 feet. The bird was using perches within 15 feet of the water in the shade, beneath overhanging trees. It gave a single *click* note. It was within 150 yards of this spot that the other two species of kingfishers were taken.

The wing and tail of this bird measure 141 and 80 mm., respectively. The difference of 61 mm. is diagnostic of *C. a. mexicana* according to Brodkorb (Auk, 57: 543–545, 1940). Also the supraloral white stripe is much reduced. The occurrence of a *mexicana*-like bird this far south in Colombia is significant.

♂, February 5, 120 gm., testis 5 mm.

Chloroceryle americana hellmayri Laubmann.—One was taken from some low branches of a tree overhanging the slough. The bird was about 12 feet above the water. The spotting of the under parts of this bird are sparse in degree comparable to that in other examples of *hellmayri* and in contrast to the condition in *C. a. americana*.

♂, February 10, 28 gm., testis 2 mm.

Galbula ruficauda ruficauda Cuvier.—Jacamars were frequently encountered, solitarily, in streamside woodland where they usually perched in open branchwork below the crowns of the trees. Once one sat on an exposed top of a dead tree. The birds attract the eye both by their odd elongated outline and the jerky movements of the head and bill. The bill is flicked about, apparently in order to catch insects moving in the foliage. The stomach of one contained flies and what appeared to be bees. Insects are evidently not taken while the bird is in flight but are seized by the long tweezer-like bill. Some individuals were breeding, but others apparently were not.

♂, January 21, 26 gm., testis 2 mm.; ♀, January 21, 30 gm., 1 empty follicle, 1 enlarged ovum; ♀, January 24, 27 gm., ovary inactive; ♂, January 28, 27 gm., testis 3 mm.; ♂, January 30, 28 gm., testis 7 mm.; sex?, February 4, 28 gm.; ♂, February 7.

Picumnus olivaceus olivaceus Lafresnaye.—Piculets were common in the streamside woodlands. I was at once impressed with the versatility of these generalized woodpeckers. In forage behavior they may perform like nuthatches, titmice, or woodpeckers, often in rapid succession, as occasion demands. Although the tail is not adapted for, nor used in, clinging, the birds may assume an upright posture on a trunk or limb surface and may peck vigorously, throwing the head with hammer-like strokes as do other woodpeckers; they are not limited to the jabbing head strokes of nuthatches. The tapping is as loud as that of sapsuckers. In landing from a flight, they may come to rest upside down, or vertically as a woodpecker on a flat trunk, or again in normal perching fashion on a horizontal twig. They not only can hang like a titmouse in small twigs, but actually can progress head downward on a trunk. It is difficult to see how they are inferior in any respect to these several specialized trunk and twig foraging types with which I have compared them, even though we have become accustomed to think of these specializations as divergent, somewhat incompatible modifications. The generalized ability of piculets as tree-surface foragers doubtless lies fundamentally in the large, zygodactyl foot; the foot is much larger relative to body size than in the nuthatches.

The note of this species consists of a high-pitched trill, somewhat like a warbler song, yet fundamentally it is nothing but a rapid, high-pitched Downy Woodpecker trill. A juvenile in company of adults was heard giving a single thin *peep*.

On January 30, two piculets were noted 30 feet above ground, exactly opposite each other in vertical position on a small upright limb. Both were pecking. When taken, they proved to be an adult male which was molting and a male in juvenal plumage with cream-colored spots on the crown; one new crown feather with a red spot, the adult male type, was still in its sheath.

On February 7 a piculet was flushed from a nest hole in a low-hanging dead limb four inches in diameter. The hole was five feet from the ground and was drilled in hard wood. Chisel marks from the bird's bill were in evidence all around the entrance and in the passage. The aperture was about three-fourths of an inch in diameter; the passage led inward about an inch before turning downward.

♀, January 21, 12 gm.; ♀, January 28, 14 gm., ovary inactive; ♂, juv., January 30,

12 gm.; ♂ ad., January 30, 15 gm., testis 1 mm.; ♀, January 31, 11 gm.; ♂, February 4, testis 1 mm.; sex?, February 4, 12 gm.; sex?, February 4, 13 gm.

Centurus subelegans rubricapillus Cabanis.—Open timber mixed with organpipe cactus constituted the habitat of this woodpecker. The cactus may be essential, as the birds frequently are seen working on the upper arms of it, much as do Gila Woodpeckers. None was seen in the damper, heavier woods along the main river. Concerning the species name, see Gilliard (Amer. Mus. Nov., No. 1071: 7, 1940).

♂, January 15, 50 gm., testis 4 mm.; ♀, January 19, 44 gm.; ♂, January 19, 43 gm., testis 5 mm.; ♂, January 23, 46 gm., testis 3 mm.

Phloeocastes melanoleucos malherbii (Gray).—Near the slough in a row of tall trees bordering a drainage channel a pair of these woodpeckers was taken. No others were seen in the region. The female was first heard pounding and was then sighted near a nest hole 25 feet up on the main trunk in live wood. The aperture appeared to be five inches in diameter and faced the watercourse. The female was not yet ready to lay but might have attained full breeding state in a few weeks. The disturbance made by the wounded female attracted the male. It came to the nest tree and pounded on a dead stub above the nest. Once it backed down the trunk a distance of about six feet. For nomenclature, see Wetmore (Proc. U. S. Nat. Mus., 87: 212, 1939).

♂, January 28, 242 gm., testis 8 mm.; ♀, January 28, 232 gm., ova 2 mm.

Ceophloeus lineatus nuperus Peters.—Twice encountered in woods bordering sloughs or rivers. The birds were silent except for tapping and were not breeding. The one skin preserved shows the coloration of *nuperus* but the wing is long for this form (see Peters, Occas. Papers Bost. Soc. Nat. Hist., 5: 320-321, 1930); wing chord, 192 mm.; bill, 38.5.

♀, February 1, 180 gm., ovary inactive; ♀, February 3.

Dendroplex picus dugandi Wetmore and Phelps.—This was the common woodhewer of the area, although it was not seen in large numbers. It ranged from low, open scrub cover to heavy streamside woodland. On January 20 one of these birds was noted flying from one thorn clump to another in open country; few of the low spreading trees here had trunks as much as eight inches in diameter. This bird proved to have a white-shelled egg in the oviduct. The birds from Villavieja are typical of this recently described form (Proc. Biol. Soc. Wash., 59: 64-65, 1946).

♂, January 19, 40 gm., testis 11 mm.; ♀, January 20, 45 gm., laying; ♀, January 21, 40 gm., old brood patch; ♀, January 27, 42 gm.; sex?, January 30, 41 gm.; ♂, January 31, 39 gm., testis 8 mm.

Lepidocolaptes souleyetii lineaticeps (Lafresnaye).—The series of piercing staccato notes that constitutes the call of this woodhewer is highly pitched and thinner than the corresponding notes of *Dendroplex picus*. Twice this species was encountered, each time in large streamside trees, where the birds worked up the trunks in typical woodhewer fashion.

♂, January 30, 25 gm., testis 3 mm.; ♂, January 31, 25 gm., testis 7 mm.

Synallaxis albens insignis Zimmer.—These ovenbirds stayed in dense cover, usually in or near tall grass and annuals. When they were found in low trees, they apparently had moved there to take up calling posts. The "song" or call is a harsh, buzzing note with strong downward inflection, repeated at about one-second intervals over long periods of time. Females as well as males were taken while giving this note from fixed position. When in a tree, they sought not an exposed post but one in a dense clump of foliage or in mistletoe-like growths. None of the birds taken, even though in breeding condition and in seemingly adult plumage, had double-layered

skulls typical of most adult passerine birds; probably this condition is never attained in *Synallaxis*. Evidence concerning the breeding season of the ovenbirds is confusing, but probably indicates protracted, possibly year-round, breeding by the population as a whole. Singing birds with enlarged gonads were taken that were far advanced in molt, whereas others that were breeding were in full worn plumage; still others were in fresh plumage but were non-breeding or were in the strikingly rich brown juvenal dress.

♂, January 18, 16 gm., testis 6 mm., molting; ♀, juvenal plumage, January 24, 16 gm., iris dull brown; ♂, January 24, 16 gm., testis 6 mm., iris light rust; ♂, February 4, 16 gm.; ♀, February 5, 18 gm., ovary inactive; ♂, February 7, 16 gm., testis 4 mm.

Thamnophilus doliatus albicans Lafresnaye.—Abundant all through the thorn scrub and in lesser numbers in the lower tangles of streamside woodland. They seemed usually to be paired. The call note consists of loud, resonant notes somewhat owl-like in quality, although slightly guttural, given with increasing cadence but with little variation in pitch. Both members of a pair give it, the female less often and on slightly higher pitch. A male watched calling, on January 16, leaned forward with neck outstretched and crown raised. As the calling proceeded, the neck swung downward. Antshrikes were sluggish in their movements and stayed in the thick cover. Two of the females taken showed signs of breeding.

♂, January 13, 32 gm., testis 3 mm., iris ivory; ♂, January 16, 30 gm., testis 3 mm.; ♀, January 16, 29 gm., iris white; ♀, January 18, 33 gm., laying—1 empty follicle; ♀, 34 gm., oviduct enlarged, iris white; sex?, January 24, 30 gm.

Formicivora grisea hondae (Chapman).—These antbirds were conspicuous inhabitants of thorn scrub and of lower woodland trees. They flitted about in the cover somewhat in the jerky fashion of Redstarts. The long, white, silky flank feathers were fluffed out and displayed. One of their notes consists of a series of six or more elements, in quality remindful of the worry notes of Olive-sided Flycatchers.

♂, January 14, testis 4 mm.; ♂, January 16, 15 gm., testis 2 mm., molting; ♀, January 18, 13 gm., ovum 2 mm., molting; ♂, January 20, 12 gm., testis 1 mm., "female" plumage; ♀, 11 gm., January 20; ♂, January 20, testis 3 mm.; ♂, 12 gm., testis 6 mm.

Pachyramphus rufus (Boddaert).—Met only once, on February 6, when one was calling in the open crown of a streamside tree 25 feet above ground. The note was something like the trill of a small woodhewer.

♂, February 6, 17 gm., testis 5 mm.

Erator inquisitor albitorques (Dubus).—This cotinga, like the preceding one, seemed to be scarce in the region. On January 28, a female came into a dead tree top in the river-bottom forest and sat quietly. It had recently laid, having completed a clutch of three eggs, as shown by the empty follicles in the ovary. On February 6 a pair came silently into the tree where the *Pachyramphus* had been taken a few moments before. The pair was silent and was carrying food.

This genus is small in number of forms, but its structural differentiation from the related *Tityra* is of such magnitude in respect to tarsal scales, loral feathering and bill shape that I cannot see justification for merging the two as Hellmayr has done [Field Mus. Nat. Hist., Zool. Ser., 13 (6): 204, 1929]. The differences are much greater than between most passerine genera; see also Wetmore (Proc. U. S. Nat. Mus., 93: 284, 1943).

♀, January 28, 44 gm.; ♂, February 6, 42 gm., testis 5 mm.; ♀, February 6, 36 gm.

Fluvicola pica (Boddaert).—This strikingly white flycatcher was strictly limited to the vicinity of water, either the borders of the slough in the river bottom or the playa lakes on the plains south of Villavieja. The birds commonly flitted about over the water in the bushes or grass that grew at the margins or that stood in the water. They seldom took a fixed lookout post in search for insects but moved about more like gnatcatchers or fly-snapping warblers. I follow Wetmore (Proc. U. S. Nat. Mus., 87: 225, 1939) in considering this form specifically distinct from *F. albiventer* from south of the Amazon.

♀, January 31, 15 gm., laying; ♂, January 31, 14 gm., testis 5 mm.; ♀, January 31, 12 gm.; ♀, February 7, 13 gm., oviduct enlarged; ♀, February 8, 10 gm. S., 12 gm.

Pyrocephalus rubinus piurae Zimmer.—In the plaza in the town of Neiva, on January 12, a pair of Vermilion Flycatchers frequented some open trees near the fountain. The male caught a large cicada and the female took it from him. She then pounded the insect while the male crowded close to her, somewhat disturbing her, but not trying vigorously to take the prey away. Several times the cicada was dropped and caught in the air near the ground. Finally the female broke off part of the abdomen and the male took away the remainder of the insect. The female swallowed her piece. The male, at some distance, broke up his part and may have swallowed some of it, but soon he brought a large piece over to the female, sat beside her, and let her take it when she reached out for it. She promptly swallowed the bite.

At Villavieja, Vermilion Flycatchers were common along the streets in town and along the railroad. They ranged out into adjacent open scrub and heavily grazed pasture. They avoided woodland and were not seen in the badlands nor in tall grass and denser scrub. Some were always seen about the sparse vegetation at the playa lakes south of town.

♀, January 17, 14 gm.; ♂, February 2, 10 gm. S., 16 gm., testis 9 mm.; ♂, February 2, 15 gm., testis 8 mm.

Muscivora tyrannus monachus (Hartlaub).—Common in tracts of savanna where they perched on tops of trees and on fences. A sharp *tick* note, given singly or in rapid sequence, was the only sound uttered by them. This flycatcher was noted attacking one of the small caracaras (*Milvago*).

♂, January 13, 31 gm., testis 14 mm.; ♂, January 20, 32 gm., testis 10 mm.

Tyrannus melancholicus chloronotus Berlepsch.—Notes of this kingbird were the first sounds heard in the morning in town, when the chorus of weak sputtering notes sounded from all directions. Kingbirds were abundant in savanna and open scrub. Evidently many were breeding, although no nests were inspected.

♀, January 14, 44 gm., brood patch; ♂, January 21, 38 gm., testis 14 mm.

Tyrannus dominicensis dominicensis (Gmelin).—Apparently a winter visitant. One only was detected.

♀, February 4, 43 gm., ovary inactive.

Legatus leucophaius leucophaius (Vieillot).—This flycatcher was found well up in the large trees of the stream courses, although not along the main river. The actions of the bird, as also its notes, reminded me of a Wood Pewee.

♂, January 27, 21 gm., testis 5 mm.; ♂, January 30, 24 gm., testis 7 mm.

Myiodynastes maculatus difficilis Zimmer.—Found in the timber bordering the intermittent stream courses in the Laja Valley. The loud, harsh calls of this species were frequently heard in such situations. Breeding individuals were taken.

♂, January 25, 46 gm., testis 13 mm.; ♀, January 25, 43 gm., oviduct enlarged; ♂, January 30, 45 gm.; ♀, February 6, 45 gm., ovary inactive.



(Upper) TREES AND UNDERSTORY OF WOODLAND IN LAJA VALLEY, NEAR VILLAVIEJA, HUILA, COLOMBIA.

(Lower) SCATTERED THORN SCRUB AND CACTUS AT BORDER OF PLAYA LAKE ON PLAINS 10 KILOMETERS SOUTH OF VILLAVIEJA.

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Megarynchus pitangua pitangua Linnaeus.—Common in the better-developed woodland where they foraged chiefly beneath the crowns of the trees among the larger branches and trunks. A bird taken on January 16 near a large nest high in the trees had greatly enlarged gonads, although it was molting. At other places family groups were seen and the yodeling squall of this species was then much in evidence. The specimens taken had been feeding on cicadas and others were seen pounding these large insects and mashing them in their capacious and well adapted bills. The feeding habits and the correlated bill structure are quite in contrast with those of the related Kiskadee or Derby Flycatcher which takes insects on the wing in the open, working from exposed lookouts.

♂, January 16, 64 gm., testis 13 mm.; ♂ juv., February 6, 55 gm.; ♀, February 6, 60 gm., old brood patch.

Myiozetetes cayanensis hellmayri Hartert and Goodson.—Found commonly in the open scrub and along the borders of woodland at low or middle heights. A fully grown juvenile was taken on January 18. An adult taken on January 29 was laying.

♀, January 27, 27 gm., ovary inactive; ♀, January 29, 29 gm., laying.

Pitangus sulphuratus rufipennis (Lafresnaye).—Not numerous, but occasionally seen on tree tops.

♂, January 30, 60 gm., testis 8 mm.

Myiarchus crinitus boreus Bangs.—This migrant from North America was twice taken in streamside woodland, in the same group of trees with the resident *Myiarchus apicalis*.

♀, January 23, 36 gm.; ♀, February 6, 30 gm.

Myiarchus ferox panamensis Lawrence.—A pair of this species was taken in the woods bordering the Laja River. They were moving about at a height of about 25 feet. They had a loud, clear burbling note. The cover in which they were found seemed no different from that where the other species of *Myiarchus* were taken in the same valley.

♂, February 4, 32 gm., testis 2 mm.; ♀, February 4, 33 gm., ovary inactive.

Myiarchus apicalis Sclater and Salvin.—On January 19 a sexually inactive female was watched investigating a hole in a fence post at the edge of streamside woods. A male in breeding condition was taken near here on January 23. The species seemed confined to woodland, either of the smaller tributary valleys or of the main river course.

♀, January 19, 28 gm.; ♂, January 22, 30 gm., testis 11 mm.; ♂, January 23, 30 gm., testis 8 mm.

Empidonax traillii traillii (Audubon).—Once detected, when a bird was found flitting about in streamside twigs.

♀, January 29, 13 gm.

Tolmomyias sulphurescens confusus Zimmer.—A female taken on January 27 was building an elaborate globular nest situated at the tip of a limb 20 feet above ground. This was in a tract of dense timber. The nest entrance was low on one side and was overhung. Other individuals also were taken in the dense, relatively humid type of woodland.

The three specimens from Villavieja are typical of *confusus* in their bright yellow under parts and dark upper parts (see Zimmer, Amer. Mus. Nov., No. 1045: 8-9, 1939) and do not show any certain intermediacy in this regard toward the paler *asemus*. However, they are of the large size of *asemus* (see measurements). *Asemus* has been reported from as near Villavieja as Chicoral, Tolima. The individual concerned is in poor plumage and the wing is unmeasurable, but its coloration does seem to be that of

asemus. It would appear that the influence of *confusus* extends across the eastern Andes from the type locality at Villavicencio into the upper Magdalena basin, but in this area there is a sign of intergradation in that the characters of the two races (color and size) are there mixed. De Schauensee (Proc. Acad. Nat. Sci. Phila., 97: 45, 1945) comments on the resemblance of two birds from El Tambo (presumably in Cauca Valley) to *confusus*, but I am unable to coördinate his observations with mine; he apparently made no direct comparison with *asemus*.

Measurements of wings of birds of known locality

T. s. asemus

♂	108996	A. M. N. H.	East of Palmira, Cauca	67.0 mm.
♂	112209	A. M. N. H.	Río Frio, Cauca	67.2
♂	108130	A. M. N. H.	Cali, Cauca	66.4
♂	133659	A. M. N. H.	Dabeida, Río Sucio	68.3
♀	498342	A. M. N. H.	Jiménez, W. Colombia	68.9

Villavieja birds

♂	93897	M. V. Z.		69.2
♂	93898	M. V. Z.		69.4
♀	93896	M. V. Z.		70.6

T. a. confusus

♂	133660	A. M. N. H.	Malena, Antioquia	65.9
♀	122173	A. M. N. H.	Buena Vista above Villavicencio	64.1
♀	122174	A. M. N. H.	Villavicencio	64.5
♀	122176	A. M. N. H.	Opon, Magdalena River	64.3
♀	181149	A. M. N. H.	Río Suno, Ecuador	63.0

♀, January 27, 17 gm., ovum 2 mm.; ♂ ad., January 28, 14 gm., testis 8 mm.; ♂, im. skull, January 31, 15 gm., testis 8 mm.

Todirostrum cinereum cinereum (Linnaeus).—Common throughout the woodlands of the valley. The blunt, finch-like notes are surprisingly loud for so small a bird. The birds seldom left the cover of the foliage, moving about therein like warblers.

♀, January 22, 7 gm., iris white; ♀, January 22, 7 gm., iris white; ♂, January 29, 7 gm.

Todirostrum sylvia superciliare Lawrence.—Only once was this species detected, when, on January 28, one was taken in the understory of the timber near the river.

♂, January 28, 7 gm., testis 5 mm., iris white.

Euscarthmornis margaritaceiventris septentrionalis (Chapman).—This small flycatcher was abundant in the scrub growth where it called loudly and frequently. The birds stayed within the cover but often were not much protected from the sun by the scant foliage.

The form *septentrionalis* has been poorly known and has been ascribed a peculiar distribution [Hellmayr, Field Mus. Nat. Hist., Zool. Ser., 13 (pt. 5): 322, 1927]. Chapman (Bull. Amer. Mus. Nat. Hist., 33: 176, 1914) named it as a species from two specimens taken at Honda, Tolima. He also reported a specimen from Anzoategui, 4750 feet, Lara, Venezuela. Hellmayr listed an additional example from Maraquitá, near Honda. In the American Museum are three additional specimens (nos. 150450–2) from La Vela de Coro, Falcón, and El Cuji, Lara, Venezuela. These last and some Bogotá skins appear to me less gray dorsally than typical *sep-*

lentrionalis and than my specimens from Huila, although they are not as greenish as *impiger*. As regards distinguishing features of *septentrionalis* and *impiger* other than dorsal color, I find the bill color somewhat variable in both, although an average distinction is evident, *impiger* possessing a redder bill. I do not find constant differences in bill shape and size along the lines suggested by Chapman. Thus *septentrionalis* seems to show incomplete differentiation; it scarcely can be maintained as a full species. It is, I think, a geographic race of the upper Magdalena basin, possibly with a range extending even beyond this area. Partly in accord with Hellmayr (*loc. cit.*), I would view occasional dark-backed birds from the coastal section of Venezuela as individual variants of *impiger*.

The improved representation of *septentrionalis* now available, which includes birds in fresh plumage, throws light on the relation to *E. margaritaceiventer* and its races. Hellmayr (*loc. cit.*) has suggested that *impiger* and *margaritaceiventer* are conspecific and this now seems well indicated by the annectant character of *septentrionalis*. The form *E. m. wuchereri* of northern Brazil is so similar in coloration to unworn plumages of *septentrionalis* that on first examination I was in doubt concerning their racial distinctness. *Wuchereri* is, however, somewhat grayer on the pileum; the difference between the color of the pileum and that of the back is a little more definite. In bill color and shape I can see no dependable differences in the small samples at hand. Therefore, although geographic junction of *wuchereri* and *septentrionalis*, or of *rufipes* and *septentrionalis*, has not actually been shown, the imperfect differentiation of the southern and northern representatives hardly permits maintaining them as species. The very dark forms (*auyantepui* and *duidae*) of the mountains of south-eastern Venezuela represent a separate line of modification which, if indeed within specific limits, is of greater magnitude than that of the northern lowland races.

♂, January 14, 9 gm., testis 5 mm., skull partly single layered, iris yellow; ♂, January 15, 10 gm., testis 7 mm., skull and iris as in preceding; ♂, January 20, 10 gm., testis 2 mm., skull "im."

Atalotriccus pilaris pilaris (Cabanis).—A loud, harsh call attracted my attention to this flycatcher in some open streamside trees where it was perched 20 feet above ground. I think this species was scarce, although it may have been overlooked through confusion with the common *Euscarthmornis*.

♂, January 27, 6 gm., testis 6 mm., skull partly single layered, iris white.

Euscarthmus meloryphus meloryphus Wied.—Twice taken in thick mimosa scrub, once on a mesa, and once beside the Laja River. The aspect of this bird in life and in the hand suggests an antbird as much as a flycatcher. It is not surprising to me therefore that its taxonomic position is in doubt [see Hellmayr, *Field Mus. Nat. Hist., Zool. Ser.*, 13 (pt. 5): 357, 1927].

♂, January 13, 7 gm., testis 2 mm.; ♂, February 4, 7 gm., testis 3 mm.

Elaenia flavogaster flavogaster (Thunberg).—This *elaenia* reminded me of the *Phainopepla* in its actions. Its short, broad bill and elevated crest doubtless contributed to the illusion. The species was encountered in savanna and in woodland borders where the birds were seen flying erratically between trees or perched in the crowns of trees.

♂, January 16, 24 gm., testis 9 mm.; ♂, January 29, 25 gm., testis 8 mm.; ♀, January 29, 22 gm.

Myiopagis viridicata pallens Bangs.—Once taken in the forest understory near the main river. The bird was working about in a dark ravine near a large tree trunk. It proved to be in heavy molt, involving wings and tail; nevertheless the gonads were fairly large. For use of generic name, see Zimmer (*Amer. Mus. Nov.*, No. 1108: 20, 1941).

♂, January 21, 15 gm., testis 4 mm.

Phaeomyias murina incomta (Cabanis and Heine).—This exceedingly plain fly-catcher was once detected in a thicket of small trees along a ravine running through a grassy slope. It was calling loudly. As in the preceding species, a complete molt was in progress while the bird was sexually active.

♂, January 18, testis 6 mm.

Iridoprocne albiventer (Boddaert).—These Tree Swallows were seen perched on an old snag on a gravel bar in the middle of the Magdalena River and also at times along the wires paralleling the railroad. The birds were noted singly or in pairs and were less common than the Rough-winged Swallows. On February 4, Tree Swallows were noted entering nest crannies under the eaves of the railway station.

♂ ad., January 24, 15 gm., testis 11 mm.

Stelgidopteryx ruficollis aequalis Bangs.—Seen chiefly over the grassy fields and on the telephone wires, but also locally along small watercourses. On January 28, a pair was hovering in front of a small sand bank at the edge of a river terrace. The female, which was taken, showed no sign of sexual activity, however. Although frequently noted in pairs, none of the other birds preserved as specimens was sexually active.

This form of swallow differs appreciably from the races of Rough-winged Swallow of North America in quality of note, which is less guttural, and in shorter wing with consequent differences in flight. In the air the wing action is more like that of Tree Swallows without the effect of long, trailing primaries typical of *S. r. serripennis*. Were it not for the apparently complete transitional series of forms in Central America, the distinctly different coloration and the appreciable differences in behavior of the northern and southern representatives of *Stelgidopteryx* might argue for their specific distinctness.

♀ ad., January 24, 13 gm., ovary inactive; ♀ ad., 14 gm., ovary inactive; ♂ ad., January 30, 15 gm., testis 2 mm.; ♂ ad., February 7, 14 gm., testis 1 mm.

Cyanocorax affinis affinis (Pelzeln).—This jay inhabited the well-developed woodland of the stream and river courses. The birds usually were quiet and were not easily approached. On January 28, the calls of a wounded woodpecker attracted a pair of jays, which came in silently overhead. The female of this pair had recently laid an egg, as shown by the presence of an empty follicle in the ovary, and she evidently would have laid two more eggs to complete the set. Subsequently a third jay came into the disturbance but circled at some distance, giving a clear, loud whistle and also a loud, musical trill suggestive of song trills of shrikes. On January 30, a group of four young jays was found in tall timber near the Laja River. The adults were in attendance and came in close in response to squeaks. These young were fully grown, the rectrices being complete. On February 6 a family of short-tailed young was noted.

♀ ad., January 28, 232 gm., laying, iris silver; ♂ ad., 219 gm., testis 11 mm.; ♂ juv., January 30, 190 gm., iris dark; ♀ juv., January 30, 188 gm.; ♀ ad., 210 gm., iris silver; sex? juv., January 30, 192 gm., iris dark; ♂ ad., February 1, testis inactive, iris silver.

Campylorhynchus minor bicolor (Pelzeln).—Seen principally about the organpipe cactus and associated, scattered thorn trees. They also occurred in widely spaced trees adjacent to fence rows and pastures. The notes of this bird are very powerful, some of them clear, others harsh and guttural. The birds flew readily, often at heights of 25 feet above ground in moving between cactus plants. Fully grown juveniles were common, while some adults were engaged in nesting.

This form of cactus wren, which is extremely well differentiated from its conspecific relatives, has been known thus far only from Bogotá skins. Its true range, manifestly not the Bogotá area, had not been found. Chapman (1917, *op. cit.*) used the name *bicolor* for the race that is now called *albicilius* [see Hellmayr, Field Mus. Nat. Hist., Zool. Ser., 13 (pt. 8): 130-131, 1934], but he recorded a skin from Honda, northern Tolima, which Hellmayr thinks may have been true *bicolor*. Hellmayr did not examine this skin and I did not find it at the American Museum with other material from Honda; presumably Chapman's report of it was an error, as there is no record of such a cactus wren in the Museum's collection. In any event, Hellmayr's guess that true *bicolor* replaces *albicilius* in the upper Magdalena Valley is fully substantiated by its occurrence at Villavieja. My specimens from there agree well with Hellmayr's (*loc. cit.*) diagnosis and match skins in the Rothschild Collection, which presumably Hellmayr also had examined; he had studied the type in the Vienna Museum. Measurements, for comparison with Hellmayr's figures, follow.

♀ ad., January 13, wing 89 mm., tail 83, bill (culmen) 28, 60 gm., laying, 4 empty follicles; ♂ juv., January 13, wing 93 mm., tail 86, 49 gm.

Troglodytes musculus striatulus (Lafresnaye).—Present in town in small numbers and in the brushy margins of woodland or in the understory of open woodland. Singing was sporadic during January and February. An adult male was taken on January 26 in which one eye had not developed properly; there was the merest trace of the eye structure.

♂ juv., January 21, 16 gm.; ♂ ad., January 26, 16 gm., testis 4 mm., primaries molting.

Mimus gilvus tolimensis Ridgway.—This species of mockingbird appears much larger in the field than *polyglottos* of North America. Also the tail is carried less sharply uplifted. The song seems less sustained and vigorous. Mockers occurred in cactus and thorn scrub and in savanna—in general in the drier and more open areas. As with many other tropical species, individuals that were molting nonetheless showed a considerable development of the gonads. This was true of an immature which was just finishing the postjuvénal molt.

Three birds taken at Leiva, Boyacá, are much smaller (♂, wing, 122.6 mm.; ♀ ♀, 107.6, 116.8) than *tolimensis* and are best classed as *melanopterus* [see measurements given by Hellmayr, Field Mus. Nat. Hist., Zool. Ser., 13 (pt. 7): 318-319, 1934]. They serve to set the southern boundary of *melanopterus* in this sector, as they are somewhat intermediate. Weights of a male and a female are 62 and 53 grams, respectively, in sharp contrast with those of *tolimensis* listed below.

♂ ad., January 18, 88 gm., testis 6 mm., heavy molt, wing 135.2 mm.; ♂, im. (skull), January 19, 79 gm., testis 5 mm., wing 125.8 mm.

Turdus ignobilis ignobilis Sclater.—"Robins" were not common about Villavieja and this and the following very similarly colored species were not distinguished from each other while in the field. An example of *ignobilis* was taken at the border of the slough.

♀ ad., February 3, 79 gm., oviduct enlarged.

Turdus leucomelas albiventer Spix.—One was taken in broken woodland and pasture on January 15. There were empty follicles in the ovary. The bird was in badly worn plumage and was beginning to molt. I follow Todd (Proc. Biol. Soc. Wash., 44: 54, 1931) in using the name *albiventer* for this bird. The characters claimed for *ephippialis* [Hellmayr, Field Mus. Nat. Hist., 13 (pt. 7): 401, 1934] do not seem to me to be developed with sufficient constancy in material in the American Museum collection from Venezuela and Colombia to warrant recognition of that form.

♀, January 15, 72 gm.

Hylocichla ustulata swainsoni (Tschudi).—This North American species was noted occasionally in the woods. On January 15 during a heavy rain one gave call notes and broke into half-voiced song much as Hermit Thrushes do on their wintering grounds.

♂, January 15, 30 gm., testis 1 mm.

Poliophila plumbea anteocularis Hellmayr.—Gnatcatchers were seen chiefly in mimosa scrub and frequented these trees even where they were far spaced in savanna formation in pasture lots. The whining notes are very similar to those of *P. caerulea*. The bill is notably long. In combination with mockingbirds and cactus wrens these gnatcatchers gave a distinctly Sonoran aspect to the avifauna of the tracts of mimosa and cactus.

♀ juv., January 13, 6 gm.; ♀ ad., 6 gm., ovary inactive, molting; ♂ [adult plumage], January 26, 6 gm., testis 4 mm.

Hylophilus flavipes flavipes Lafresnaye.—These vireos move about deliberately in the foliage, like other members of their family, yet in other ways they did not remind me of vireonids. They were seen to hang under limbs, occasionally, like chickadees. One was observed as it gradually let itself down backward over the limb on which it had been perching until it was suspended beneath. This species gives a series of thin whistles, with upward inflection, rapidly repeated. They were found to come readily to imitation of this note which evidently is a song. *Hylophilus* was abundant in the woodland and there were many juveniles on the wing.

♂ ad., January 14, 14 gm., testis 5 mm., iris ivory; ♂ juv., January 14, 14 gm., iris dark; ♂ ad., January 18, testis 4 mm.; sex? juv., January 18; ♂ ad., January 22, 12 gm., testis 5 mm.

Cyclarhis guyanensis canticus Bangs.—Frequented tall streamside trees, working slowly about high above ground. The ringing, clear song of this species is suggestive of that of *Icterus crysater*, but is shorter and of fixed pattern. One bird had caught a large insect and was singing periodically between efforts to swallow it. Three singing males were heard in the vicinity of the slough, stationed about a quarter of a mile apart.

♂ ad., February 3, 27 gm., testis 9 mm., iris light brown; ♂, February 3, 30 gm.

Coereba flaveola columbiana (Cabanis).—This honey creeper was scarce in the vicinity of Villavieja. Males were occasionally detected singing in the crowns of fairly tall trees near the stream courses. The song is wiry and strongly accented, much as are some wood warbler songs; there are three well separated couplets to begin with, followed by a rapid trill.

♂ ad., January 31, 10 gm., testis 7 mm.

Conirostrum leucogenys leucogenys (Lafresnaye).—An adult female taken on January 22 was gathering nest material. Two days later a male was taken at the same place, a small tract of open woodland near the river. At times these birds hang upside down like chickadees. Nowhere were they common. For use of the generic name, see Zimmer (Amer. Mus., Nov., No. 1193: 11, 1942).

♀ ad., January 22, 7 gm., oviduct enlarged; ♂ ad., January 24, 7 gm., testis 5 mm.; ♀ juv., February 5, 7 gm.

Protonotaria citrea (Boddaert).—One was taken in open twigs at the edge of the slough on February 5. Few Prothonotary Warblers have been taken so far south in winter.

♀ ad., February 5, 15 gm., ovary inactive, little fat.

Dendroica petechia aestiva (Gmelin).¹—Common throughout the woodlands. One taken on February 4 is typical of this race. A prenuptial body molt was taking place.

♂ ad., February 4, 12 gm., testis minute.

Seiurus noveboracensis noveboracensis (Gmelin).—This water-thrush was a common winter visitant, occurring along the banks of sloughs and small streams and in the woodland floor adjoining, where the ground was damp. Their sharp call notes were heard regularly in such places even when the birds, which were shy, could not be seen.

♀ ad., January 27, 16 gm., ovary inactive; ♀ ad., January 28, 16 gm., ovary inactive.

Oporornis philadelphia (Wilson).—Found frequently in the damp woodlands near the slough where they frequented low tangles and understory vegetation up to 20 feet. One of the males taken still showed evidence of immaturity in the skull.

♀ ad., January 28, 10 gm.; sex? [♂] ad., January 31, 12 gm.; ♂ im., February 7, 11 gm.; ♀ ad., February 7, 10 gm.

Geothlypis aequinoctialis aequinoctialis (Gmelin).—Seen only in a tract of waist-high bunch grass on dry ground in the vicinity of the river and slough. A badly worn breeding female was taken, and on February 10 a black-masked male, presumably of this species, was seen momentarily at close range in the bunch grass.

♀ ad., February 3, 15 gm., oviduct enlarged, old brood patch.

Setophaga ruticilla (Linnaeus).—This winter visitant from the north was occasionally seen in the woodlands. No black-plumaged males were noted.

♀ ad., January 23, 7 gm.; sex? ad., February 1, 7 gm.

Basileuterus delatrigii mesochrysus Bonaparte.—Common in tangled woodland understory near the watercourses but not necessarily close to the ground. The song has the sharp accents of a yellow-throat song but the end trails off into something like the song of a Yellow Warbler or a Redstart.

♂ ad., January 21, 11 gm., testis 8 mm.; ♂ ad., January 22, 12 gm., testis 7 mm.; ♂ ad., January 25, 15 gm., testis 7 mm.; ♀ im., January 26, 12 gm.

Psarocolius decumanus melanterus (Todd).—These oropendolas were conspicuous but not very numerous in the woodlands. Groups of about six were sometimes seen, but often single birds or pairs only were noted. In a large open tree in the Laja Valley a group of nests was seen at a distance where they overhung an area of impenetrable brush. Oropendolas frequently were seen in and about the tree but were not noted entering the nests. There were three nests, at least, hanging from limb tips. The structures appeared to be about three feet long. The song performance of this species is a startling combination of staccato squeaks superposed on a continuous wheeze. It is difficult to believe, until a bird is closely watched, that one bird makes the simultaneous array of sound.

Wetmore (Proc. U. S. Nat. Mus., 87: 251, 1939) has pointed out that Hellmayr [Field Mus. Nat. Hist., Zool. Ser., 13 (pt. 7): 10-11, 1937] was mistaken about the significance of an action of the International Zoological Congress at Padua and that *Xanthornis* is not available as a generic name for this group of oropendolas. However, usage of *Ostinops*, to which Wetmore reverts, seems to be incorrect, for this name is antedated by *Psarocolius* Wagler (Syst. Av., 1, fol. 22, 1827). Wagler provides a detailed diagnosis, and "*Oriolus cristatus*" "Gmelin," (= *decumanus* Pallas), the form first listed and described by Wagler, was subsequently designated the type of *Psarocolius* by Gray (Cat. Gen. Subgen. Birds: 68, 1855).

¹ I use the specific name *petechia* in accordance with the standards adopted in The Auk for A.O.U. Check-List birds. I believe, however, that *petechia* and *aestiva* are not conspecific and that the correct name of the present form is *Dendroica aestiva aestiva* (Gmelin).

♀, January 14, 177 gm., iris blue; ♀, January 19; ♂ ad., January 21, testis 3 mm.; ♂, January 27.

Molothrus bonariensis cabanisi Cassin.—A solitary male was taken from the crown of a tall tree near the Laja River. It had flown in from the open country and its crop was filled with grain. A breeding female was taken from a dead tree top by the slough. It chattered in the same way as does the female of *M. ater*. No other cowbirds were detected in the course of my stay.

♂ ad., January 30, 69 gm., testis 9 mm.; ♀ ad., February 5, 57 gm., ovary with 2 empty follicles and 2 yellow ova.

Icterus auricapillus Cassin.—Only once seen, when a bird was taken from the crown of a tall tree near the Laja River. This species has not previously been reported so far south. Chapman did not record it south of Honda, in the Magdalena Valley. However, there is a specimen (no. 130995) in the American Museum from the region between Giradot and Ibagué, Tolima, taken in August, 1913, and another (no. 176555) from "Guevara," Tolima, taken in August, 1918.

♂ ad., February 6, 31 gm., testis 6 mm.

Icterus chrysater giraudii Cassin.—Seen principally in scattered small trees and patches of thorn scrub and cactus. The species was not numerous, but the loud, clear songs of the males, and their color, readily attracted attention.

The two adult males taken are typical of *I. c. giraudii*, showing the light yellow coloration and size of that form. The occurrence of *giraudii* in the Tropical Zone at Villavieja is of particular significance because of Chapman's contention (*op. cit.*: 634, 1917) that it is limited to the Subtropical Zone. De Schauensee (*Notulae Naturae*, No. 167: 12, 1946) has also reported *giraudii* from a tropical area in the Chocó region of northern Colombia. Chapman's description (*Bull. Amer. Mus. Nat. Hist.*, 33: 191-192, 1914) of a distinct species, *Icterus hondae*, from the Tropical Zone was somewhat supported by the supposed complementary zonal distribution of it and *giraudii*. Since this supposition is proved to be at least partly erroneous and since Villavieja is but 230 kilometers south of Honda (600, not 3000 feet), type locality of *hondae*, and in the same valley, increased doubt arises concerning the validity of *hondae* [see Hellmayr, *Field Mus. Nat. Hist.*, Zool. Ser., 13 (pt. 10): 131-132, 1937; de Schauensee, *loc. cit.*].

The type and only other specimen of *hondae* are young males. Orioles of this group often molt their juvenal rectrices and remiges at an early age, but some of them at least retain brown primary coverts as evidence of their immaturity. Immature, brightly colored birds with a full set of brownish primaries and rectrices, the feathers grown in the nest, are scarce. However, the two examples of *hondae* are of such plumage. Measurements of similarly plumaged *I. c. giraudii* reveal, as in many other passerine species, that these brown rectrices and remiges are shorter on the average than the black flight feathers which sooner or later replace them. Measurements of wing and tail of such brown-feathered *giraudii* range down to those of *hondae* (see table). It thus seems clear the small size claimed for *hondae* is not a dependable character but may be explained by immaturity.

The specimens of *hondae* are indeed richer orange than normal *giraudii*, but in a large series of the latter there is much variation in color. Immatures often are dark orange, especially adjacent to the black of the head and throat; occasionally presumed adults are similar. Selected examples of *giraudii* equal *hondae* in richness of orange, some with respect to throat and neck, others with respect to pileum. None is as deeply orange on the interscapular region, but the approach is very close, especially to the condition in the duller topotype, no. 123162. I am therefore forced

MEASUREMENTS IN MILLIMETERS OF SELECTED MALE SPECIMENS OF
Icterus chrysater AND *Icterus hondae*

Specimen	Locality	Wing	Bill length from	
			Tail	nostril
<i>I. hondae</i>				
123163 A. M. N. H., im. (type)	Honda, Tolima	91.5	93.0	1.8
123162 A. M. N. H., im.	Honda, Tolima	90.0	91.0	1.7
<i>I. chrysater</i>				
117519 A. M. N. H., im.	Andalucia, Huila	96.0		1.7
168879 A. M. N. H., im.	Mambita, ENE Bogotá	90.0	93.5	2.0
136754 A. M. N. H., im.	Darien, Panamá	94.0	91.5	1.7
93986 M. V. Z., ad.	Villavieja, Huila	100.5		1.9
93987 M. V. Z., ad.	Villavieja, Huila	105.0	104.0	1.9

to view *hondae* as an individual variant of *giraudii*, probably encompassed entirely within the full range of age and individual variation of that form. *Hondae* should be carried in the synonymy of *giraudii* until such time as new evidence comes to hand from the Honda area to indicate its validity. I do not anticipate that such evidence will appear.

♂, January 14, 59 gm., testis 9 mm.; ♂ ad., January 23, 61 gm., testis 8 mm.

Tanagra concinna (Sclater).—Seen infrequently in the more open, drier woodland. On February 4, one was singing a warbler-like song in a low canopy of streamside trees. Members of a mated pair taken on January 20 were in breeding condition. In view of uncertainty regarding the specific affinities of the forms *finschi*, *saturata* and *concinna* (see Zimmer, Amer. Mus. Nov., No. 1225: 12-13, 1943) the binomial is here employed.

♂ ad., January 20, testis 7 mm.; ♀ ad., January 20, 10 gm., oviduct enlarged; ♂ ad., January 21, 9 gm., testis 3 mm.; ♂ ad., February 4, 12 gm., testis 8 mm.

Tangara ruficapilla (Sclater).—Twice this tanager was encountered, both times in the crowns of thirty-foot trees in open woodland. On January 29, a pair was chasing two cactus wrens, apparently in defense of a nesting area. For the use of the generic name, see Zimmer (Amer. Mus. Nov., No. 1245: 2, 1943).

♂ ad., January 15, 23 gm., testis 10 mm.; ♀ ad., January 29, 24 gm., oviduct enlarged.

Thraupis episcopus cana (Swainson).—This common tanager was well established in the scattered trees in town, but it occurred also in open woodland. The birds moved about over large areas, even flying over open land to isolated tree clumps.

♂ ad., January 18, 37 gm., testis 13 mm.; ♂ juv., January 21, 35 gm.; ♂ ad., January 26, testis 10 mm.

Thraupis palmarum atripennis Todd.—Noted only in the woodland bordering the slough where one was taken from the crown of a tree on February 3. Numbers of this species must be small in the region.

♂ ad., February 3, 34 gm., testis 1 mm.

Ramphocelus dimidiatus dimidiatus Lafresnaye.—These tanagers were largely confined to the vicinity of watercourses where they were particularly associated with tall grass and brush tangles and the trees overhanging this cover. The only note heard from the species was a buzzing bleat, not unlike the buzz of a Lazuli Bunting. Immature and juvenal birds lacked an expanded basal horn sheath of the ramus, and the

color of this area was black instead of the pale blue of adult males. An adult female was in intermediate condition.

♂ ad., January 27, 28 gm., testis 8 mm.; ♀ ad., February 3, 29 gm., ova 2 mm.; ♂ ad., February 3, 31 gm., testis 8 mm.; ♂ im., February 3, 30 gm., testis 3 mm.; ♂, February 3, 27 gm.; ♀, February 3, 28 gm.; sex? juv., February 6, 30 gm.

Piranga rubra rubra (Linnaeus).—This winter visitant was encountered occasionally in the woodland, usually moving about rather silently, high up in the trees.

♀ ad., January 18, 32 gm.; ♀ ad., January 25, 32 gm.; ♂ ad., January 29, 30 gm., testis 1½ mm.

Saltator albicollis striatipectus Lafresnaye.—Moderately common in brush and vine tangles of open woodland, ranging into dense trees 25 feet in height and into tall continuous scrub. The cardinal-like whistles were heard occasionally, but song was not much in evidence. The birds adhered to cover and usually were difficult to see.

♂ ad., January 16, 37 gm., testis 8 mm.; ♂ ad., January 18, 38 gm., testis 8 mm.; ♂ ad., January 21, 42 gm., testis 9 mm.; ♂ juv., February 4, 41 gm.

Hedymeles ludovicianus (Linnaeus).—Only once noted, on February 1. The bird was undergoing a prenuptial molt of the head and part of the body.

♂ ad., 40 gm., testis 2 mm.

Tiaris bicolor omissa Jardine.—One was taken on January 16 on a grassy slope on which there were scattered clumps of three-foot bushes. Not otherwise detected.

♂ ad., January 16, 12 gm., testis 6 mm.

Spermophila minuta minuta (Linnaeus).—Seedeaters were common in grassland wherever there also were scattered trees or shrubs; these they normally used for song posts. Usually the grass was at least knee-high. The definitely patterned song is of sweet, clear notes, somewhat in quality like that of *Spinus psaltria*, but of fixed length.

♂ ad. (dull plumage), January 25, 9 gm., testis 2½ mm.; ♂ (red plumage), January 26, 7 gm., testis 5 mm.; ♂ (red plumage), January 29, 7 gm., testis 5 mm.; ♂ (dull plumage), 10 km. S. Villavieja, February 2, 9 gm., testis 6 mm.; ♂ ad. (red plumage), February 3, 7 gm., testis 8 mm.

Volatinia jacarina splendens (Vieillot).—These grassquits were abundant in the open tracts of tall grass, where the males were going through their song performance above the grass tops. In preparing specimens of this species I was impressed with the weakness of the connective tissues and consequent looseness of the skin.

♀ ad., January 20, 12 gm., 1 empty follicle, 1 ovum 4 mm.; ♂ ad., January 29, 9 gm., testis 4 mm.; ♀ ad., February 5, 10 gm., old brood patch; ♂ ad., February 7, 10 gm., testis 5 mm.; ♂, February 7; ♂, February 7.

Spinus psaltria colombianus (Lafresnaye).—Scarce in the vicinity of Villavieja. One was taken on January 18. The notes of this race are like those of the North American races except for the low-pitched flight call which is a nasal bleat instead of a clear, soft note. The bird from Villavieja has a distinct white area in the tail whereas two males from Leiva, Boyacá, lack this marking [for discussion of variability, see Hellmayr, Field Mus. Nat. Hist., Zool. Ser., 13 (pt. 11): 301, 1938].

♂ ad., January 18, 9 gm., testis 5 mm.

Sicalis luteola luteola (Sparman).—On February 8, at one of the playas south of Villavieja, a scattered flock of these finches frequented the mimosa trees about the edge of the marsh. They gave a squeaky, two-parted note, suggestive of that of a Pine Siskin. At times they flew out over the grass, disappearing, only to reassemble about the pond. Occasionally they engaged in a prolonged twittering song. This sometimes was given while hovering above the bushes. Many of the birds were

juveniles or adults in poor plumage. Once a group of these finches was detected flying over the badlands.

♂ ad., 11 gm., testis 6 mm.; ♀ juv., 11 gm.; ♂ ad.; sex? im., 5304—all taken February 8, 10 km. S. Villavieja.

Coryphospingus pileatus rostratus, new subspecies

Type.—Adult male, no. 94041 Mus. Vert. Zool., taken at Villavieja, 435 meters, Huila, Colombia, January 15, 1945, by Alden H. Miller; orig. no. 4969.

Diagnosis.—Similar to *Coryphospingus pileatus brevicaudus* and *C. p. pileatus*, but bill much longer, the elongation resulting in relative attenuation and in accentuation of the curved and acute culmen. Tail apparently short on the average, as in *brevicaudus*. Coloration similar to that of *brevicaudus*, although development of white loreal spot is evidently variable. A series of adult males might reveal consistently paler ventral coloration.

This form is known only from five specimens taken at Villavieja, but it may be presumed to be the race occupying the arid upper Magdalena Valley. Heretofore this species of Pileated Finch has not been detected west of the eastern Andes. This is surprising in view of its abundance at Villavieja. Chapman's parties failed to take it in Colombia and Hellmayr [Field Mus. Nat. Hist., Zool. Ser., 13 (pt. 8): 381, 1938] records it only east of the mountains, assuming, possibly correctly, that Bogotá skins came from the llanos.

The appearance of the bill of this form is so distinctly different from that of its relatives that even a small sample may suffice for characterization of a race. Even in the three young birds the elongation is evident, although in one of these that appears particularly young, it is less pronounced than in the others. Measurement of length of bill from nostril expresses this difference (see table). Among males of *brevicaudus* and *rostratus* there is no overlap in measurements, but one female of *brevicaudus* does equal the smallest young male *rostratus* in measurement; in general, females show bill dimensions which fully equal those of males, and measurements of the sexes can safely be combined as I have done with the sample of *rostratus*. Tests for reliability of differences of means show the figure for bill length of *rostratus* to be significantly greater than the figures for the other two forms. Similarly the difference in tail length of *brevicaudus* and *C. p. pileatus* has been shown to be reliable. Comparative material of *brevicaudus* was available chiefly from the vicinity of Cumaná, Venezuela, near the type locality, and from Ciudad Bolívar in the Orinoco Valley.

MEASUREMENTS IN MILLIMETERS

	No.	Bill length from nostril		No.	Tail	
		Mean	s		Mean	s
<i>C. p. pileatus</i> , ♂ ♂	9	8.44 ± .06	0.19	9	58.7 ± .70	2.11
<i>C. p. brevicaudus</i> , ♂ ♂	12	8.70 ± .06	0.20	9	52.2 ± .52	1.79
<i>C. p. brevicaudus</i> , ♀ ♀	—	—	—	9	48.3 ± .42	1.25
<i>C. p. rostratus</i> , 4 ♂ ♂, 1 ♀	5	9.70 ± .07	0.17	[3 ♂ ♂: 47.4, 52.5, 57.3; 1 ♀: 50.2]		

At Villavieja, Pileated Finches were the most numerous birds in the open thorn scrub. Loose groups of three to six individuals were probably family aggregations. Fully grown, streaked juveniles and females were much in evidence and one had to

search the flocks for adult males. Feeding was carried on at the edges of the thorn clumps or sometimes beneath them. No singing was noted and there was no other sign of breeding in progress.

♂ ad., January 13, 19 gm., testis 2 mm., complete molt in progress; ♂ im., January 13, 17 gm.; ♂ im., January 15, 17 gm.; ♂ ad., January 15, 17 gm., testis 3 mm.; ♀ im., January 16, 17 gm.

Arremonops conirostris inexpectatus Chapman.—Taken only in heavy, shaded brush and vine tangles along the stream courses. The song is saltator-like but longer than that of *Saltator albicollis*.

The specimens taken are typical of *inexpectatus* in all details of color as specified by Chapman (*op. cit.*: 570, 1917). I can see no approach to *A. c. conirostris*, and the contrast is strong with Chapman's *A. c. conirostris* from Chicoral, Tolima; *chrysoma* is more brilliantly green. However, the birds from Villavieja are not short-winged as is typical of *inexpectatus*. The wing is 76.2 mm. in the adult male, and 73.4 and 74.1 in the adult females as compared with 70.4, 69.6, 68.0, 68.6 in males of *inexpectatus* and 69.9 in a female of that race. A male and a female of *A. c. conirostris* from Chicoral measure 77.5 and 71.5, respectively. The extension of range of *inexpectatus* to the floor of the Magdalena Valley and hence closer to the range of *A. c. conirostris* is significant in view of the supposed restriction of *inexpectatus* to the headwaters of the Magdalena River. This is true even though the Villavieja birds in view of their combination of color and size characters may be regarded as somewhat intergradient between the races. It seems likely that *inexpectatus* will prove to be a form of inconstant size which occupies the whole arid upper Magdalena basin.

♀ ad., January 25, 37 gm., ova 2 mm., brood patch; ♂ ad., 39 gm., testis 8 mm.; ♂ ad., January 26, 40 gm., testis 8 mm.; ♀ ad., 33 gm., brood patch; ♂ juv., February 7, 36 gm.

Myospiza humeralis humeralis (Bosc).—These birds are fundamentally Grasshopper Sparrows in behavior and habitat preference. Even though the song is less insect-like than that of *Ammodramus*, and in fact much like that of *Passerculus*, their horizontal posture while perched, their flight, and their general appearance suggest *Ammodramus* from which they may not be usefully set aside generically. The species was common in the grasslands of the plains where there was at least some grass or annuals of knee height. Scattered bushes were used for low song and lookout posts. The birds also occurred in smaller grass plots and in mixed scattered brush near Villavieja. One fully grown juvenile was taken and many adults were encountered that were scolding as though they had young.

Chapman (*op. cit.*: 567, 1917) pointed out that his birds from Chicoral in the Magdalena Valley, "are paler than *columbiana* and more nearly resemble" the birds from the middle Orinoco region (*M. h. humeralis*); nonetheless they were listed under *columbiana*. My specimens from Villavieja, many of them in better plumage than Chapman's specimens, even more clearly relate to *M. h. humeralis* as represented in collections from eastern Venezuela, the middle Orinoco, northeastern Brazil and Matto Grosso, Brazil. They lack the heavy dorsal black streaking of *columbiana*, and the fresh feathers of the back are broadly bordered with gray and the median parts are but moderately brown. They thus correspond with the paler, less brown variants of *M. h. humeralis*. I am by no means convinced that Hellmayr [Field Mus. Nat. Hist., Zool. Ser., 13 (pt. 8): 477, 1938] is correct in doubting the existence of the two northern races of the species, *columbiana* and *meridana*, although individual variation is great. Adequate local series might reveal a number of recognizable races. It does seem evident from material now available that *columbiana* extends up

the Magdalena Valley only part way, as to Honda, that farther south in Tolima there is intergradation or close approach to *humeralis*, and that in Huila, in the arid upper Magdalena basin, *humeralis* occurs in typical form or is possibly even paler than average. Some Bogotá specimens apparently pertain to *humeralis* and may have confused the concept of *columbiana* and *meridana* in the past.

♂ juv., January 13, 15 gm.; ♂ ad., January 17, 6 km. SE. Villavieja, 18 gm., testis 1 mm., complete molt in progress; ♀ ad., January 17, 6 km. SE., 17 gm., ovary inactive, body molt; ♀ ad., January 17, 6 km. SE., 15 gm., brood patch; ♂ ad., January 17, 6 km. SE., 18 gm., testis 7 mm.; ♂ ad., January 18, testis 4 mm.; ♀ ad., January 25, 19 gm., ovary small, brood patch.

DISCUSSION AND SUMMARY

The avifauna of the arid Tropical Zone of the upper Magdalena Valley was clearly shown by Chapman (*op. cit.*) to be related to the west-Andean and Caribbean tropical faunas and only indirectly to the tropical faunas of the eastern llanos and the Amazonian basin. This fundamental conclusion is unchanged by later work, but the improved knowledge of racial differentiation and distribution in the upper Magdalena Valley has materially elaborated this picture and has brought to attention the importance of this district as a differentiation center.

Among the forms recorded from Villavieja, Huila, the following appear to be endemic to this tropical district. Certain of them extend beyond it somewhat, particularly northward, but all seem to center in this arid basin and probably differentiated there. (The name in boldface indicates the endemic element.)

Ortalis columbiana columbiana

Colinus cristatus leucotis

Speotyto cunicularia tolimae

Lepidopyga goudoti goudoti

Thamnophilus doliaetus albicans

Euscarthmornis margaritaceiventris septentrionalis

Campylorhynchus minor bicolor

Poliophtila plumbea anteocularis

Tanagra concinna

Coryphospingus pileatus rostratus

Arremonops conirostris inexpectatus

Additional to these, *Myrmeciza longipes boucardi* seems to be endemic to the district, although I did not encounter it in the field, and there doubtless are others which at present are inadequately known. Some apparent endemics of the region may not be truly related to the arid habitats of the floor of the valley and hence did not appear at Villavieja.

Apart from this list of local differentiates, there is a large group of west-Andean forms that range far to the north or west, or both, even into Central America, and which here in the Magdalena Valley reach their eastern limits. In other words, they are not widespread South American forms that extend into Venezuela (except locally at the north) or into east-Andean Colombia or Brazil. Some indeed are

restricted to the Magdalena drainage, but not merely to the upper part of it.

<i>Ortalis columbiana</i> subsp.	<i>Myiarchus apicalis</i>
<i>Jacana jacana hypomelaena</i> *	<i>Atalotriccus pilaris pilaris</i> *
<i>Columbigallina passerina parvula</i> *	<i>Cyanocorax affinis affinis</i>
<i>Brodiaea jugularis jugularis</i>	<i>Troglodytes musculus striatulus</i>
<i>Amazona ochrocephala panamensis</i>	<i>Mimus gilvus tolimensis</i>
<i>Chloroceryle americana hellmayri</i>	<i>Turdus ignobilis ignobilis</i>
<i>Picumnus olivaceus olivaceus</i>	<i>Cyclarhis guyanensis canticus</i> *
<i>Ceophloeus lineatus nuperus</i>	<i>Basileuterus delatitrii mesochrysa</i> *
<i>Dendroplex picus dugandi</i>	<i>Psarocolius decumanus melanotus</i>
<i>Formicivora grisea hondae</i> *	<i>Molothrus bonariensis cabanisii</i>
<i>Pyrocephalus rubinus piurae</i>	<i>Tangara ruficapilla</i>
<i>Myiozetetes cayanensis hellmayri</i>	<i>Thraupis palmarum atripennis</i> *
<i>Myiarchus ferox panamensis</i>	<i>Ramphocelus dimidiatus dimidiatus</i>

Those marked with an asterisk in the foregoing list apparently are absent from the arid tropical district of the upper Cauca Valley. Chapman (pp. 126-127) presents another partial list of absentees, not confined to west-Andean forms, and he explains that this situation can be accounted for only by the high degree of isolation of the Cauca Valley.

One significant conclusion reached through better acquaintance with the avifauna of the upper Magdalena is that there is in it an element derived from the llanos across the Andes to the east. Chapman did not recognize this particular element. He did list (pp. 122-123) a group of species that crossed through the gap at Andalucia, but they are evidently forest-dwelling types in the main and not characteristically found in arid tropical habitats. The following forms detected at Villavieja are essentially eastern types, some of which extend to the middle as well as the upper Magdalena Valley:

<i>Buteo magnirostris magnirostris</i>	<i>Geothlypis aequinoctialis aequinoctialis</i>
<i>Geranoospiza caerulescens caerulescens</i>	<i>Tiaris bicolor omissa</i>
<i>Falco sparverius intermedius</i>	<i>Coryphospingus pileatus</i> subsp.
<i>Zenaidura auriculata stenura</i>	<i>Myospiza humeralis humeralis</i>
<i>Tolmomyias sulphurescens confusus</i>	

Certain of these species, as the Sparrow Hawk, are tolerant of un-forested parts of higher zones and may cross the eastern Andes at the present time either in the form of continuous populations or through vagrant dispersal. Others may be effectively isolated now, but probably gained access in the not distant past by crossing the Andes. *Coryphospingus pileatus* would seem to have come in by this route, but in its racial differentiation it reflects a current isolation.

The study at Villavieja has resulted in extension of known range southward in the Magdalena Valley of many species. These did not appear in the course of collecting at San Agustín or below Andalucia, probably because these localities are not fully representative of the arid tropical environment. Why a number of them did not come to light at Chicoral is difficult to explain. The forms, with indications of previously known southernmost stations, are:

Jacana jacana hypomelaena, Puerto Berrio?
Columbigallina passerina parvula, Chicoral
Columbigallina talpacoti rufipennis, Chicoral
Aratinga wagleri wagleri, Chicoral
Brotozeris jugularis jugularis, Honda
Amazona ochrocephala panamensis, Honda
Speotyto cunicularia tolimae, "Tolima"
Chloroceryle amazona mexicana, "northern Colombia"
Galbula ruficauda ruficauda, Chicoral
Centurus subelegans rubricapillus, Chicoral
Ceophloeus lineatus nuperus, Honda
Dendroplex picus dugandi, Chicoral
Thamnophilus doliatus albicans, Chicoral
Myiarchus ferox panamensis, Chicoral
Myiarchus apicalis, Chicoral
Atalotriccus pilaris pilaris, Chicoral
Euscarthmornis margaritaceiventris septentrionalis, Honda
Cyanocorax affinis affinis, Chicoral
Poliophtila plumbea anteocularis, Chicoral
Hylophilus flavipes flavipes, Chicoral
Conirostrum leucogenys leucogenys, Honda
Icterus auricapillus, Honda
Tanagra concinna, Honda
Tiaris bicolor omissa, Chicoral

By way of contrast, there are a few birds among the eastern element and the endemic element which on the basis of present information do not range north either to Chicoral or Honda. Some are replaced at these localities by more northern races. These species serve to emphasize that the greatest development of the distinctive arid tropical fauna of the upper Magdalena is not attained until one passes south of the Giradot (Chicoral) area. The races are:

Tolmomyias sulphurescens confusus (replaced by *asemus*)
Campylorhynchus minor bicolor (not of Chapman, see p. 371)
Coryphospingus pileatus rostratus
Arremonops conirostris inexpectatus (replaced by *A. c. conirostris*)
Myospiza humeralis humeralis (replaced by *columbiana*)

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WINTER BIRDS OF UPLAND PLANT COMMUNITIES¹

BY T. L. QUAY

INTRODUCTION

THE purpose of the work described in this paper was to determine the relative abundance of the winter birds occurring in each stage of the upland plant succession at Raleigh, North Carolina. It was based on the assumption that a preliminary study of the winter bird populations associated with the plant communities would be useful to the general problem of the ecological succession of birds. Only the occurrence of the birds, by species and individuals, in the various plant stages was recorded. The factors governing such habitat selection and abundance were not investigated.

The course of revegetation of abandoned fields in the vicinity of Raleigh, N. C., was first worked out by Crafton and Wells (1934). Oosting (1942: 118) describes the complete succession in the Piedmont:

Almost without exception upland communities have developed on abandoned fields. They are characterized by a few distinct and easily recognized stages of dominance which regularly succeed each other. Fields abandoned for one year are dominated by *Leptilon canadense* and *Digitalia sanguinalis*. The second year *Aster ericoides* with a mixture of *Ambrosia artemisiifolia* is the important species. By the third year *Andropogon* (usually *A. virginicus*) is dominant and it maintains itself until shaded out by pine (*P. taeda* or *P. echinata*) whose seedlings may be found among the broom-sedge as early as the third year. Pine may overtop the *Andropogon* by the fifth year and frequently forms closed stands in 10-15 years. Neither of these pines reproduces in its own shade but several hardwoods do. A pine stand is middle-aged by forty years and by then there will have developed a distinct understory of subordinate hardwoods such as red gum, black gum, dogwood and sourwood. In addition several seedling and transgressive oaks and hickories will be present. By 70-80 years the pine is overmature and as it thins out it is replaced by oaks and hickories which have increased steadily in the lesser strata. Eventually (150-200 years) oak-hickory dominance may be attained with scattered pine remaining as relics.

All the study-plots were within a rectangular area of 15 square miles of agricultural land bordering Raleigh on the west. About 70% of the region is cleared farmland, pastures and abandoned fields; 30% is in woody growth, mostly pines. Only two pieces of deciduous woods suitable for study were found. Pine woodlands and bare fields were plentiful. Fields in the herbaceous stages were both fewer and smaller than desired.

¹ From a thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in North Carolina State College, 1940. Acknowledgment is made to Dr. Z. P. Metcalf and to Dr. B. W. Wells, for aid and suggestions and for reading the manuscript.

The data presented in this paper were collected between November 1, 1939, and March 1, 1940. Four months proved to be the longest period relatively uninfluenced by migratory movements. Temperature and precipitation for the period were approximately normal as compared with the previous 54 years.

METHODS

Repeated counts were made on selected plots of known acreage and vegetational constitution. Forty fields were used for study-plots, totaling 680 acres: Bare Field, 14; Crab Grass, 6; Crab Grass-Tall Weeds, 2; Tall Weeds-Broomsedge, 5; Broomsedge-Pine, 6; Pine, 5; Deciduous Woods, 2. In addition, 7 Bermuda Grass (*Cynodon dactylon*) pastures in use by cattle, totaling 230 acres, were similarly studied for comparative purposes. Pastures are not a stage in the direct succession but abandoned pastures go into tall weeds or broomsedge. The number of plots in each stage, and the size of the plots, were influenced by availability. Plots varied from 2 to 87 acres and averaged 17 acres.

Seventy-five censuses were made, plus 11 on pastures, each one in the morning between sunrise and noon. On each census the plot was systematically examined by walking back and forth until it was completely covered. All birds seen definitely in the plot were recorded. The time spent on a plot varied with size and according to the difficulty of seeing the birds. The average time was 40 minutes per census. No specimens were collected nor was any attempt made at subspecific identification.

No Bare Field was completely bare. The first eight plots were sown to winter grain, the green blades standing two inches high in thin rows six inches apart; the remainder had only scattered tufts of crab grass. Only two small fields of mixed Crab Grass-Tall Weeds were found. No pure Tall Weeds plots were located. The mixed Tall Weeds-Broomsedge fields showed a graded series from those in which tall weeds were dominant and broomsedge subdominant to those in which broomsedge was dominant and tall weeds subdominant or common. No plots of pure Broomsedge were found. In the Broomsedge-Pine plots, the pines were young, from 3 to 20 feet high, scattered, and either sub- or co-dominant; tall weeds were always common to uncommon, but not rare or subdominant. Pine plots varied somewhat but supported a similar bird life throughout. In the Deciduous Woods, pines were always common but never sub- or co-dominant.

RESULTS

Table 1 summarizes by stages the number of plots, plot size in acres, census distribution, number of species and average number of birds-per-acre; the data on pastures is added at the bottom.

TABLE 1
SUMMARY OF CENSUSES BY STAGES

Stage	Plots	Acres	Censuses	Species	Average number birds-per-acre
<i>Bare Field</i>	14	281.2	31	15	2.35
<i>Crab Grass</i>	6	47.3	9	8	10.50
<i>Crab Grass-Tall Weeds</i>	2	7.1	2	7	—
<i>Tall Weeds-Broomsedge</i>	5	50.5	9	9	10.10
<i>Broomsedge-Pine</i>	6	60.1	9	7	6.50
<i>Pine</i>	5	91.4	10	25	7.00
<i>Deciduous Woods</i>	2	142.0	5	23	1.00
<i>Totals</i>	40	680.0	75	42	4.35
<i>Pastures</i>	7	230.0	11	12	2.8

The birds were listed according to their frequency and abundance within each stage. Frequency is a percentage measure of the number of censuses on which the species was recorded. Abundance is a more subjective value, the numbers one to five being used to designate the following relative values: 5—the Most Abundant and widespread species; 4—Abundant but not the most abundant; 3—Common or frequently present; 2—Uncommon but not rare; 1—Rare or accidental. Abundance is not based on frequency alone, but also on the number of individuals per census and duration of occurrence throughout the four-month study period. The abundance and frequency ratings for all the bird species in all stages appear in Table 2. The frequencies are not comparable between stages, because of the differences in number of censuses per stage and in size and number of plots. The abundance values are felt to be fairly comparable from stage to stage.

Bare Fields.—The Meadowlark was the Most Abundant bird on Bare Fields, with Killdeer and Mourning Doves Common. Twelve species were Uncommon to Rare. The Savannah Sparrow's presence was conditioned by the existence of a little crab grass or lespedeza. One or two Sparrow Hawks were always found around each group of fields. Horned Larks were present only between December 26 and January 24, when there was snow and ice. Pipits were last seen on December 21. Species found only in this stage were: Horned Lark, Pipit, Killdeer, Starling and Cowbird. The bird population of the Pastures was quite similar to that of the Bare Fields. The Meadowlark was again the Most Abundant bird, and the Starling was the only Common species.

TABLE 2
ABUNDANCE AND FREQUENCY RATINGS FOR ALL BIRDS IN ALL STAGES

Frequencies under Crab Grass-Tall Weeds in parentheses because based on only two censuses. R = Resident Status, P = Permanent Resident, W = Winter Resident. Har = Highest Abundance Rating obtained by each species. a = abundance, f = frequency.

Species	R	Har	Bare Field	Crab Grass	Crab Grass-Tall Weeds	Tall Weeds-Broom Pine	Broom Pine	Pine	Decid. Woods	Pastures
Meadowlark	P	5	a f	a f	a f	a f	a f	a f	a f	a f
Killdeer	P	3	5 39	3 33	—	—	—	—	—	5 81
Mourning Dove	P	3	3 26	—	—	—	—	—	—	1 9
Sharp-shinned Sparrow	W	2	2 13	5 100	3 (100)	3 67	3 56	—	—	2 27
Field Sparrow	P	2	1 22	1 22	4 (100)	4 78	4 67	—	—	—
Juncos	W	4	1 3	1 11	3 (100)	3 67	3 56	—	—	—
Song Sparrow	W	3	—	—	—	—	—	—	—	—
Golden-crowned Kinglet	W	5	—	—	—	—	—	—	—	—
Ruby-crowned Kinglet	W	4	—	—	—	—	—	—	—	—
Pine Warbler	W	4	—	—	—	—	—	—	—	—
Chickadee	P	4	—	—	—	—	—	—	—	—
Myrtle Warbler	W	3	—	—	—	—	—	—	—	—
Brown Creeper	W	3	—	—	—	—	—	—	—	—
Titmouse	P	3	—	—	—	—	—	—	—	—
Winter Wren	W	3	—	—	—	—	—	—	—	—
Carolina Wren	P	3	—	—	—	—	—	—	—	—
Sparrow Hawk	P	2	2 13	—	—	—	—	—	—	—
Horned Lark	W	2	2 13	—	—	—	—	—	—	—
Starling	P	2	2 10	—	—	—	—	—	—	—
Pipit	W	2	2 6	—	—	—	—	—	—	—
Flicker	P	1	1 6	—	—	—	—	—	—	—
Bob-white	P	1	1 3	—	—	—	—	—	—	—
Crow	P	1	1 3	—	—	—	—	—	—	—
Bluebird	P	1	1 3	—	—	—	—	—	—	—
Goldfinch	W	1	1 3	—	—	—	—	—	—	—
Vesper Sparrow	P	2	1 3	—	—	—	—	—	—	—
Mourning Dove	W	1	—	—	—	—	—	—	—	—
Downy Woodpecker	W	2	—	—	—	—	—	—	—	—
Brown-headed Nuthatch	W	2	—	—	—	—	—	—	—	—
Hermite Thrush	W	2	—	—	—	—	—	—	—	—
Sharp-shinned Hawk	P	1	—	—	—	—	—	—	—	—
Barred Owl	P	1	—	—	—	—	—	—	—	—
Hairy Woodpecker	P	2	—	—	—	—	—	—	—	—
White-breasted Nuthatch	P	2	—	—	—	—	—	—	—	—
Blue-headed Vireo	P	2	—	—	—	—	—	—	—	—
Sapsucker	P	2	—	—	—	—	—	—	—	—
Robin	P	2	—	—	—	—	—	—	—	—
Cardinal	P	2	—	—	—	—	—	—	—	—
Phoebe	P	2	—	—	—	—	—	—	—	—
White-throated Sparrow	W	2	—	—	—	—	—	—	—	—
Red-bellied Woodpecker	P	1	—	—	—	—	—	—	—	—

Number of Species.....42

15

12

29

12

Crab Grass.—The Savannah Sparrow was the Most Abundant bird of the Crab Grass, with a frequency of 100 and an average of 67 individuals per census on plots that averaged 8 acres in size. The Meadowlark was Common. The remaining 6 species were Rare.

Crabgrass-Tall Weeds, Tall Weeds-Broomsedge, Broomsedge-Pine.—In all three of these old-field stages the Field Sparrow was the Most Abundant species, the Junco was Abundant, and the Savannah and Song Sparrows Common. The other 8 species were Rare. There were no exclusive species in any of these three stages or the Crab Grass.

Pines.—Twenty-five species appeared in the Pines, 19 of which were in no previous stage. A four-species group constituted the principal birds: Most Abundant—Golden-crowned Kinglet; Abundant—Ruby-crowned Kinglet, Pine Warbler and Chickadee. Four species were found exclusively in Pines: Brown-headed Nuthatch, Sharp-shinned Hawk, Barred Owl, Blue-headed Vireo. There were almost no differences in the species from plot to plot.

Deciduous Woods.—These woods had 23 species but were much less rich in individuals than the Pines. Nineteen of these species occurred in the Pines also. The Golden-crowned Kinglet was the Most Abundant bird and it less so than in Pines. Exclusive species were Phoebe, White-throated Sparrow and Red-bellied Woodpecker. The presence of the Red-bellied Woodpecker is indicative of the mesic nature of these woodlands.

DISCUSSION

The 42 species of birds that appear in this study represent but 50% of the total regularly found around Raleigh in winter (Brimley, 1930: 74). The reason for the difference is that the hydrosereal communities, and such modified habitats as hedgerow, thicket, barnyard and garden, were not included.

Only a few species fall in the higher abundance ratings, the majority being Uncommon to Rare. This is true both as a whole and within each stage, as shown in Table 2. The number of species, and the percentages, in each of the five abundance ratings, together with division into permanent (P), or winter (W) residence status, are:

Abundance Rating	Number of Species			Percentage
	P	W	Total	
5—Most Abundant.....	2	2	4	9.52
4—Abundant.....	2	2	4	9.52
3—Common.....	4	4	8	19.04
2—Uncommon.....	10	5	15	35.70
1—Rare.....	8	3	11	26.18
	—	—	—	—
	26	16	42	100.00

While there are 26 permanent resident to 16 winter resident species, the two types are equally divided in the first three abundance ratings, which include at least three-fourths of all individuals.

The similarities of the bird populations between the two woody stages, and among the three old-field stages, indicate the existence for the birds of only four basic habitats in the upland plant succession. These are, with their predominant birds: Bare Field (and Pasture)—Meadowlark; Crab Grass—Savannah Sparrow; Old Field—Field Sparrow, Junco; Woods—Golden-crowned Kinglet, Ruby-crowned Kinglet, Pine Warbler, Chickadee.

Most species exhibit a narrow habitat range, as illustrated in Table 3. On the basis of the 7 plant stages used for the census work, 12 species or 28% were limited to one stage, and an additional 20 species or 47% limited to 2 stages. On the basis of the 4 plant stages postulated in the preceding paragraph, 27 species or 64% occurred in but one stage.

TABLE 3

HABITAT RANGE, ALL SPECIES

On basis of seven plant stages			On basis of four plant stages		
Number of stages	Number of species	Percentage	Number of stages	Number of species	Percentage
1	12	28.56	1	27	64.26
2	20	47.60	2	9	21.42
3	3	7.14	3	5	11.90
4	4	9.52	4	1	2.38
5	2	4.76		42	100.00
6	0	0.00			
7	1	2.38			
	42	100.00			

Twenty-two species, or 52% of the total, occurred only in the woodlands. Thirteen species, or 31% occurred only in the pre-pine stages. The remaining 7 species, constituting 17% (Dove, Junco, Chickadee, Flicker, Crow, Bluebird, Goldfinch), were wide-ranging, occurring in both seral and woody stages, and disturbing somewhat the otherwise clear species shift from stage to stage.

The birds-per-acre figures listed in Table 1 are not offered as accurate quantitative estimates. They represent the average number of individuals counted per acre on each census, and are used to give comparative information only. The similarities between Bare Fields and

Pastures are shown by figures of 2.35 and 2.8 birds-per-acre respectively. The Crab Grass and the three Old Field stages had higher populations, with figures between 6.5 and 11.5 birds-per-acre. The Pines supported a much larger population than did the barren Deciduous Woods, as shown by the ratio of 7 to 1 birds-per-acre. The overall average of 4.35 individuals per acre may not be too far off from the true winter population.

SUMMARY AND CONCLUSIONS

1. A study was made of the relative abundance of the winter birds occurring in each stage of the upland plant succession in the vicinity of Raleigh, North Carolina.

2. Forty plots totaling 680 acres were used, divided among 7 stages. Seventy-five censuses were taken, between November 1, 1939, and March 1, 1940. Some relative figures are given on birds-per-acre.

3. Forty-two species were recorded. The birds of each stage were listed according to abundance and frequency. Only a few species (19%) were of high abundance. From 75% to 85% of the species exhibited a range of only one or two habitats.

4. Four basic plant habitats are indicated on the basis of their associated bird populations. These are, with their predominant birds: Bare Field—Meadowlark; Crab Grass—Savannah Sparrow; Old Field—Field Sparrow, Junco; Woods—Golden-crowned Kinglet, Ruby-crowned Kinglet, Pine Warbler, Chickadee.

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SWAINSON'S HAWK IN WESTERN WASHINGTON
WITH A NOTE ON THE TYPE LOCALITY

BY J. W. SLIPP

THOUGH rare throughout the northwest coastal belt, Swainson's Hawk (*Buteo swainsoni*) is a generally common migrant and breeding species in the open country east of the Cascade Range. In the State of Washington, it occurs with some regularity as far west as the alpine meadows of the Cascades and Mount Rainier (Taylor and Shaw, 1927; Kitchin, 1939 a, b; Slipp, ms). The present paper is intended to review and supplement what little is known regarding occurrences of this hawk in the more western portions of the state, and to summarize what has been learned of the history of the type specimen with the aim of determining as truly as possible where it may actually have been collected.

Published records of Swainson's Hawk in western Washington are mostly of a dubious nature. Thus Dawson (Dawson and Bowles, 1909: 509) held that it was an uncommon migrant and resident "undoubtedly" breeding "about the open places" of western Washington, and later asserted (1923: 1690) that it wintered "irregularly northward to . . . western Washington"; but, in the earlier work at least, it was occasionally his practice to admit questionable evidence, and his treatment of other hawks, for example the two species of *Accipiter*, is misleading in the light of the experience of other ornithologists (cf. Bowles, 1930, for example). That his views on the status of *B. swainsoni* in western Washington were not shared by his locally more experienced colleague is evidenced by both prior and subsequent publications of the latter (Bowles, 1906; Bowles *et al.*, 1924; Bowles and Decker, 1934). With Dawson's statements as precedent, the listing in Bent (1937) of western Washington localities ("probably Tacoma . . . probably Bellingham") under "Breeding Range" is understandable, though quite certainly erroneous. Bent's early spring record for "Tacoma, April 27" may possibly have the same basis as Bowles and Decker's (1934) casual mention of only one record obtained in 37 years of field experience in western Washington, but what the original data may have been in either case seems now to be indeterminable (letters of F. R. Decker, A. C. Bent, F. C. Lincoln). On the other hand, Edson's (1908, 1919) representation of this species as a "Rare summer visitor" at Bellingham is explained by him as being based on the capture of a specimen in 1893 (see below), his subsequently having "seen several other mounted specimens [presumably taken] in this [Whatcom] county," and his

having identified the species "a number of times" in the field (Edson, letter of July 6, 1942).

Even sight records, specific as to date and place but lacking descriptive notes, can hardly be taken at face value, owing to the evident rarity of the species in this region, the difficulty of separating certain plumages of *swainsoni* from comparable ones of the common and similarly variable *B. jamaicensis*, and the misidentification of actual and supposed specimens of *swainsoni* in local collections. Accordingly a few unpublished field identifications now at hand are not here detailed. Two specific accounts already on record are by Rathbun (1902, a perched bird seen near Lake Washington, March 7, 1892) and Burleigh (1929, one in flight near Renton, Feb. 15, 1920).

With the possible exception of the type, known specimens of Swainson's Hawk from western Washington are only three. The earliest of these, an adult male taken May 10, 1893, at Bellingham by J. M. Edson, and now mounted in his collection (Edson, *in litt.*) has been reported by Rathbun (1927). Two previously unrecorded skins in local collections are as follows: (1) a heavily pigmented juvenal female taken September 24, 1935, at Westport, Grays Harbor County, by Stanton Warburton, and now in the D. E. Brown collection at the Washington State Museum; and (2) a yearling male in worn and faded plumage, shot in the first week of September, 1939, at the state game farm near Steilacoom, Pierce County, and now in the E. A. Kitchin collection at the College of Puget Sound. The Steilacoom specimen was frozen at the near-by fish hatchery for a month before it was shown to me by the men in charge, who recounted the circumstances and approximate date of its capture. In the following November it was prepared by Mr. Kitchin. The measurements are large for a male, and the coloration unusually pallid. The plumage everywhere is so worn and faded as to indicate a long-delayed molt (*cf.* Bent, 1937: 227).

Notes on the food habits of the three specimens are at hand. Edson (letter of July 6, 1940) found one tree toad (*Hyla regilla*) and a dozen grasshoppers in the stomach of the Bellingham specimen. A notation on the label of the Westport specimen states that the stomach contained part of a snake (very probably *Thamnophis* in this locality). The specimen taken at the Steilacoom game farm was allegedly killed in the act of attacking a Ring-necked Pheasant.

HISTORY OF THE TYPE

By most authorities, including the third edition of the A. O. U. Check-List (1910: 159), the type locality of Swainson's Hawk is given

as merely "Near the Columbia River," following the original statements of Audubon concerning the collection of the type specimen by J. K. Townsend. The fourth edition of the Check-List (1931: 68), however, adds the restriction "= Fort Vancouver, Washington," without explanation beyond notice in the preface (p. xi) of the adoption of a general policy of supplying such restrictions for "broad" type localities, "following some previous revisor where such has been found." It may be assumed that the late Dr. Witmer Stone, then chairman of the committee in charge of preparation of the fourth edition of the Check-List and an outstanding student of both Townsend's and Audubon's ornithological labors, either sponsored or approved the restriction; but an effort to discover a definite basis for the restriction, such as would certainly have been brought to light by Dr. Stone if not already a matter of accessible record, has failed. The conclusion is that "Fort Vancouver" was in all probability an arbitrary selection, made in conformity with the announced policy of the Check-List, and based on historical inference rather than any newly found source of information.

In view of the faulty nature of the published record regarding this hawk west of the Cascades, it would be easy for even the best of non-local ornithologists to fail to appreciate the improbability of this selection. Townsend, of course, did spend much of his time in the northwest at and near Fort Vancouver, but this fact alone is hardly a convincing reason for assuming that the type of *swainsoni* was taken there; and especially is this true in view of the rarity of this species west of the Cascades and the knowledge that Townsend also collected east of these mountains. As chairman of the A. O. U. Committee on Classification and Nomenclature, Dr. Alexander Wetmore writes of the Fort Vancouver restriction as follows (letter of June 13, 1941): "So far as I can ascertain this last was inserted by the late Dr. Witmer Stone . . . Dr. Stone I know made a considerable study of the travels of Townsend and undoubtedly had some reason for this indication. I believe, however, that in this he was in error since Swainson's hawk normally does not range west of the Cascade range." The question, then, is still an open one, and a review of what has been learned of the circumstances surrounding the collection and subsequent history of the type specimen may serve to clarify matters somewhat, and perhaps to prompt others to bring conclusive information to light.

The name *swainsoni* was applied originally by Bonaparte (1838) to the *Buteo vulgaris* of Audubon's elephant folio plate 372, pub-

lished in London in 1837. The plate shows an adult female in the 'normal' color phase in the act of capturing a Carolina marsh rabbit [*Sylvilagus p. palustris* (Bachman)] against a watery southern landscape. The rabbit, if not the setting, is apparently a reflection of conditions in the vicinity of Charleston, South Carolina, where, as the guest of Bachman, Audubon spent the winter of 1836-1837 "drawing the new birds of Townsend and Nuttall" (Herrick, vol. 2: 156, see also Bachman's (1837: 337) reference to Audubon's illustration of the "Marsh Hare," *Lepus palustris*, in plate 366 (sic), vol. 4, of the Birds of America).

Some insight into the genesis of the published plate has been obtained through the kindness of Donald A. Shelley, curator of paintings of the New York Historical Society. Comparing a microfilm of the original drawing (the collection of Audubon originals in possession of the Society was then in storage) with a reproduction of plate 372, he wrote (July 7, 1943) that "as regards composition . . . our drawing . . . shows the hawk and rabbit exactly as they appear in the Macmillan reproduction. As is frequently the case, however, the background stream, house, and trees, as well as the foliage at the lower left corner are entirely missing in the Audubon water color and were evidently added by the London engraver. The original water color shows also, at the lower left, a serpent-like animal [apparently the horned toad of Audubon's plate 386, judging from Mr. Shelley's sketch] which was omitted in the engraved plate . . . there is a faint drawing of a bird's wing directly beneath this animal . . . In the upper right corner there are faint pencil lines indicating branches of trees . . . As far as I can tell this is the only composition of this subject and the elements are all pictured on a single page. Other than the inscription in pencil 'dark water,' above inscription No. 5, I can find no instruction to the engraver." [The inscriptions distributed across the lower margin of the original sheet are as follows (order and punctuation approximate): "No. 77 / Plate 381 5. Horned Agama / Tapayaxin of Hernandes 1. Common Buzzard, Female / Buteo vulgaris 2. Slate-colored Hawk, Male / 3. Female / Falco velox, Wils. 4. Marsh Hare, Female / Lepus palustris Bachman." Inscriptions 2 and 3 are not matched by figures on this sheet, but published plate 374 shows a pair of adult *Accipiter striatus velox*.] Further examination of the entire microfilm collection by Mr. Shelley failed to reveal any landscape composition related to that of plate 372 (letter of Sept. 8, 1943).

Whereabouts of the specimen from which the figure was taken are

unknown, no record having been made of it, apparently, since the original ones of Audubon and Townsend; and nowhere in the literature is there a satisfactory statement of the precise locality and date of its capture. Audubon (see below) places it near the Columbia River, and the history of the plate, together with the fact that it was late in 1837 before Audubon, then in London, learned of Townsend's arrival in Philadelphia with the remainder of his collections, makes it certain that the specimen must have been included in the first shipment of Townsend's birds to be returned to the east—that sent from Fort Vancouver in late September of 1835 and received in Philadelphia after being a year in transit. [See Audubon's letters to Edward Harris date-lined "London Oct. 26th., 1837" (Herrick, vol. 2: 170-173) and to Dr. Thomas M. Brewer (Brewer, 1880).] The failure of the Ornithological Committee of the Philadelphia Academy to mention this species in their list of specimens "worth particular notice" in Townsend's first shipment ("Townsend," 1837: 193) may have been due to faulty evaluation, oversight, or uncertainty regarding classification in this once difficult group.

Audubon's earliest recorded mention of the type of *swainsoni* is contained in a letter to William Swainson headed London, 11th January 1838 (Herrick, vol. 2: 176). Referring, apparently, to the specimen figured in his plate 372, Audubon wrote: "I certainly should like to see the *Buteo vulgaris* to compare it with mine (that [taken] at the mouth of the Columbia) and one described by Nuttall [*B. montanus* in ms.?] before the return from America of D. Richardson & of which it seems you were not aware.—I am glad nevertheless that if differing from the European bird of that name the Transatlantic bird will be honored by your own name." That the bird was taken at the actual *mouth* of the Columbia is doubtful, and Audubon does not repeat the assertion in his writings intended for publication. In view of the notorious unreliability of his casual accounts of historical and natural phenomena, the unlikelihood of this hawk occurring at the mouth of the Columbia, and Townsend's scant opportunity to obtain it there (see itinerary, below), this assertion need not be taken literally.

Audubon later, in the fourth volume of the 'Biography' (1838: 508) and volume one of the octavo 'Birds' (1840: 30), published accounts stating that the bird had been shot by Townsend near its nest on a rock near the Columbia River. Quoting from the latter source: "The specimen from which the figure before you was taken, was shot by Mr. Townsend on a rock near the Columbia River, on which it

had its nest. Unfortunately, however, he has not supplied me with any account of this species, and the only notice respecting its habits that I have seen, is that in the *Fauna Boreali-Americana* . . ." That Audubon had additional specimens at hand is indicated by the following (1840: 32): "Another specimen in my possession, procured by Mr. Townsend on the plains of Snake River, has the upper parts brown, streaked and spotted with reddish-white; the upper tail-coverts white, barred with dusky, the lower parts as above described. The colours, however, vary, and in some the upper parts are deep brown, the lower reddish or brownish-white, barred with reddish-brown" (cf. Ridgway, 1876: 35). It may be noted that Audubon's account of this species is not one of those to which Townsend is known to have taken exception (see Stone, 1906: 312); the list as presented by Stone is taken from marginal notations in the Philadelphia Academy's copy of volume 5 (only) of the *Biography*, and treats of only a few songsters.

The inferences to be drawn from the foregoing accounts of Audubon are inconclusive. Apparently he obtained at least two, and probably several, specimens of Swainson's Hawk (plus an unknown number of Red-tails) collected by Townsend on his journey to the northwest, two being labelled as collected on the Snake River plains and the Columbia River, respectively. Probably the latter, the type, also was designated a female, but if the date of collection was recorded, Audubon gives no indication of it. [Although the labelling of Townsend's specimens from the South Pacific was generally erratic and inadequate, this was not true of his earlier Pacific Northwest collection (see Stone, 1934).] That the type of *swainsoni* actually was taken from "a rock . . . on which it had its nest" is questionable, for this species nests by preference in trees, usually resorting to rock sites only when suitable trees are lacking; furthermore, Townsend was in the known breeding range of the species only in September, scarcely a likely breeding month, although there is on record an August egg date. [Bendire (1892: 238) and others record, as an extremely late date, the taking of a single egg of Swainson's Hawk "on St. Mary's River, Montana, on August 17, 1874." In the absence of a notation by its distinguished collector, Elliott Coues, the conclusion that this was an addled or abandoned egg does not seem justified.] Audubon states that no account of the habits of this species was supplied him by Townsend, which suggests that the circumstances of the capture may have been indicated on the specimen label, if not supplied *de novo* by the colorful artist-naturalist. As

Herrick remarks (vol. 1: 273-4): "Whenever Audubon went directly to nature to exercise his pencil or brush or wrote with his subject before him, he was truth itself, but in writing offhand and from memory of past events he was wont to humor his fancy." A further point to consider in striving to determine the season at which the subject of Audubon's plate was taken is that, with a selection of specimens at hand, Audubon would naturally select for illustration one in full, fresh plumage—that is, a fall specimen.

Possibly the bird was taken from the vicinity of a nest not its own, or no longer in use for more than roosting or perching purposes. In any event the mention of the rock is suggestive of the east-Cascades country, not the humid west side where tree sites are universally available and exposed rocks something of a rarity. Gabrielson and Jewett (1940) follow the A. O. U. Check-List (1931) in suggesting that the type of Swainson's Hawk was captured near Fort Vancouver, but Mr. Jewett reviews this stand unfavorably in a letter dated July 8, 1942: "Concerning the type locality of Swainson's Hawk, I have always doubted that this type was taken on or anywhere near Sauvies Island, or even Vancouver. There are no suitable rocks anywhere near either one of these localities, and not until you get up river 30 to 40 miles. However, below Sauvies Island on the Washington side not far below Longview there are some suitable rocks . . . If a hawk ever nested on Sauvies Island, it certainly nested in a willow or cottonwood tree."

The writings of Townsend shed little direct light on the problem, although "*Falco buteo*" is listed nominally in his three lists of Oregon birds (1836, 1839a, 1839b). The body of his journal makes no reference to it, but his itinerary, as outlined therein and supplemented by Hall (1937), may be reviewed in part, with an eye to evaluating his opportunities to obtain this bird on the Columbia. His party arrived at Fort Walla Walla on the 3rd, famished and tired, but were soon refreshed and on the following forenoon crossed "the river" (the mouth of the Walla Walla?) preparatory to starting down the left (*vide* Hall) bank of the Columbia on horseback on the morning of the 5th. Here the Columbia is bordered by a sandy flat backed by precipitous cliffs, the country being generally dry and treeless. The journey to The Dalles is scantily recorded. On the 9th the river bank became rocky and difficult, forcing the party inland repeatedly. Pushing on, they caught up with the main body of the expedition at a village twelve miles below The Dalles late in the afternoon of the 10th, whence they embarked in canoes on the following morning.

Hardships due to stormy weather and near disaster to both men and collections featured the trip downstream. On the 16th they arrived at Fort Vancouver, where Townsend employed himself through the fall in collecting in the vicinity of the fort, Warrior's Point on Wapato or Sauvies Island, and the lower Willamette River, on one occasion traveling as far up the latter stream as the falls. On December 2 they boarded a ship which the next day weighed anchor and started down the Columbia estuary on the first lap of a journey to the Hawaiian Islands. Stops were made at Coffin Rock on December 4, at some Indian villages on the north side of the river on December 6, and at Fort George (Astoria) on December 8. On the 9th they anchored in Baker's Bay, where Nuttall and Townsend went ashore and visited the ocean beach outside of Cape Disappointment. On the 11th they crossed the bar at the mouth of the Columbia. After a profitable winter's collecting they again approached the mouth of the Columbia on the 15th of April, 1835, entering and running as far up as Oak Point on the following day, and reaching the brig's old mooring ground at Warrior's Point on the 17th. From then until Nuttall's departure with Townsend's collection in late September of that same year, "they divided their time between Fort Vancouver and the 'Brig' stationed at the lower end of Sauvies Island near the lower mouth of the Willamette River, with numerous excursions into the adjacent country, and up the Willamette, each working his particular field" (Hall, 1937: 13). No exact record of their movements in the spring and summer of 1835 has been left, but this much may be deduced from scattered data. Townsend remained on the Columbia west of the Cascades during this entire period, although Nuttall was east of the mountains, in the vicinity of The Dalles, for some time prior to July 11, 1835.

In evaluating the foregoing, it is notable, first, that prior to shipment of his collection, Townsend's presence on the Columbia within the normal range of Swainson's Hawk was limited to a brief period in September, 1834; if he did not then obtain the specimen in question, he must at least have seen the species repeatedly. Too, the possibility that Nuttall, rather than Townsend, may actually have secured the specimen suggests itself, as Nuttall's itinerary provided additional opportunities, in the nesting season of 1835, to collect this species east of the Cascades, and it was he who supplied Audubon with Townsend's birds as well as those taken by himself. That Audubon may have attributed the specimen in question to the wrong person is not, however, bolstered by anything known to have been

written by either Townsend or Nuttall, and the number of birds collected by Nuttall was comparatively small as he was preoccupied with the collection of plants and "was not in the habit of carrying a gun" on his rambles. Presumably, too, the workmanship of any particular specimen might identify its collector where this was not designated by signature.

In summing up, an admission should be made that it is, of course, not impossible that a vagrant Swainson's Hawk may have been taken by Townsend on the lower Columbia in the spring of 1835, and it was perhaps this line of reasoning that led to the suggestion of Fort Vancouver as the restricted type locality; but objections to this are many, and in the absence of direct evidence the assumption appears unsound. It seems logical, on the other hand, to suppose that Townsend obtained his specimens of *Buteo swainsoni* (1) within the normal range of the species, and (2) at a time when weather conditions and a certain amount of leisure from other duties (*e. g.*, forced travel) would permit collecting operations. Reasoning thus, and attempting to rationalize the known biological and historical factors, including Audubon's nest-near-the-Columbia version, it is concluded that the type specimen was collected on the Columbia River, in all probability on September 4, 1834, near the mouth of the Walla Walla.

For the privilege of examining specimens and for helpful correspondence I wish to express my indebtedness to the following students of Washington ornithology: Mrs. Martha Reekie Flahaut (Washington State Museum), Mr. Stanley G. Jewett (U. S. Fish & Wildlife Service), Mr. E. A. Kitchin, Mr. J. M. Edson (Bellingham Public Museum Society), Mr. F. R. Decker, and Mr. Harold Hilton (formerly of the Washington State Game Department). The difficulties of working at a distance from the larger collections of reference materials have been reduced by the generous assistance of Dr. Alexander Wetmore (U. S. National Museum), Mr. Frederick C. Lincoln (U. S. Fish & Wildlife Service), Mr. Donald A. Shelley (New York Historical Society), Dr. Clifford Drury (San Francisco Theological Seminary), Dr. Charles M. B. Cadwalader (Academy of Natural Sciences of Philadelphia), Dr. Harvey Fisher (University of California), and Dr. E. O. Holland (Washington State College). Dr. Alden H. Miller (Museum of Vertebrate Zoology) kindly read and criticized the manuscript.

Abstract:—Undoubted occurrences of *Buteo swainsoni* in Washington west of the Cascades and Mount Rainier are three: an adult male reported taken at Bellingham in May, 1893, and two previously

unrecorded September juveniles taken at Westport and Steilacoom in 1935 and 1939, respectively. The food habits of these three specimens are noted. A review of the history of the type specimen indicates that it was taken by J. K. Townsend on the Columbia River, quite probably on September 4, 1834, near the mouth of the Walla Walla River in southeastern Washington.

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ADDITIONS TO THE PUERTO RICAN AVIFAUNA WITH NOTES ON LITTLE-KNOWN SPECIES

BY VENTURA BARNÉS, JR.

Dichromanassa rufescens rufescens (Gmelin), REDDISH EGRET.—One male and one female were collected at Cartagena Lagoon, P. R., on August 24, 1943 (Ramos). These two specimens, now deposited in the Museum of Zoology of the College of Agriculture, Mayaguez, Puerto Rico, were obtained by Sr. Ciprián Fantauzzi when he saw the birds feeding close to shore in the mud flats of the lagoon. He states that they were the only ones observed in that vicinity. This constitutes the first record of the occurrence of the Reddish Egret in Puerto Rico. Both specimens are in the dark phase. Wetmore and Swales (1931: 78) state that the species is apparently a rare resident in Haiti and the Dominican Republic; Bond (1936: 22) did not include it from Puerto Rico. Danforth (1936) never found this rare bird on the island.

Plegadis falcinellus falcinellus (Linnaeus), GLOSSY IBIS.—One male, testes rather large, Anegado Lagoon, P. R., January 9, 1941 (Biaggi). Later, on September 26, 1943, five birds were seen at Cartagena Lagoon by Prof. J. A. Ramos. Since December, 1935, when the first record of the species for Puerto Rico was secured (Barnés, 1936: 351),

the writer has found the Glossy Ibis well distributed and moderately abundant in the fresh-water bodies of the southwestern corner of the country, for a period of years. On most occasions these birds were seen associated in small flocks feeding in the mud flats along the shores of the lagoon and shallow marshes. Since 1940 we have noticed that the species was decreasing in numbers, as only few individuals have been observed during field trips to this particular section of the island. I understand that this ibis has been looked for as a game bird by local hunters who have killed many, which will eventually mean the extinction of the species in Puerto Rico. These records cited may probably be the last to be made of the occurrence of this bird in Puerto Rico.

Phoenicopterus ruber Linnaeus, FLAMINGO.—A head in perfect condition was presented to Prof. J. A. Ramos of the College of Agriculture at Mayaguez, by Mr. Antonio Mellado of Vieques Island who killed the bird at Salinas de Vieques, at the extreme eastern end of that island, on November 24, 1940. He said that this flamingo was in a flock consisting of seven birds in adult plumage.

As far as I am aware this is the first positive record of the flamingo in Vieques since Gundlach's records in 1874.

There have been consistent reports of flamingoes in Puerto Rico during the past years by several local hunters who claim to have observed them in different localities along the southern coast of the island, particularly in the vicinity of La Parguera, Lajas, and in the mud flats close to Boquerón. I have been exerting all my efforts trying to locate a flock of these magnificent birds but without any success. Since the days of Gundlach who claimed to have secured some (Wetmore, 1927: 306) there seems to be no mention of specimens. Bond (1936: 37) included Puerto Rico in the geographical range of the flamingo. Danforth (1935: 33) also included this species from the island but based only on the statements of Gundlach and without any recent record of its occurrence.

Cygnus columbianus (Ord), WHISTLING SWAN.—On December 21, 1944, while I was collecting in the vicinity of Guánica Lagoon, I heard from a game warden news that a large, white bird which looked like a goose had been killed by a local hunter and sportsman, Sr. Rafael Rivera Esbrí of Ponce, P. R. I took advantage of the first opportunity to travel to Ponce and see the bird of which the skin had been preserved. Mr. Rivera had skinned the bird and preserved the whole skin nailed to a wooden wall in his back yard. I was astonished at the sight of the large skin which I recognized as a swan. It was almost destroyed by Dermestid beetles, but Mr. Rivera presented to me the head which I kept to provide permanent evidence.

Mr. Rivera informed me that while on a hunting trip to Guánica Lagoon on December 16, 1944, he was behind a small blind shooting ducks and gallinules when suddenly he heard a peculiar whistle coming from a spot concealed by a dense association of "eneas" (*Typha angustifolia*). Looking more carefully, he spied a large, white bird which looked like a large goose, swimming in a small, open pond. He shot at it at once but missed the bird, which took to the wing hesitantly with heavy movements of its large wings. When the bird flew over the "eneas" he brought it down with a second shot. When he went to pick it up from where it fell he was greatly astonished at the sight of such a large, magnificent bird.

On October 30, 1945, I wrote to Mr. Frederick C. Lincoln about this swan, as I wondered if it might have been brought alive and kept in captivity by someone living close to Guánica Lagoon. My investigation failed to disclose any evidence to warrant such a supposition. Mr. Lincoln's reply was: "Puerto Rico is certainly far out of the normal range of this bird and the possibilities that it was brought in as a captive bird cannot be disregarded. On the other hand you are in a position to investigate this possibility, and your efforts have failed to disclose any evidence to warrant such a supposition. I feel that we are fully justified in concluding that the occurrence is a natural one."

This constitutes the first authentic record of the occurrence of the Whistling Swan in the West Indies.

Dendrocygna autumnalis discolor Sclater and Salvin, GRAY-BREASTED TREE DUCK.—On December 27, 1943, I received a partially mounted specimen of the Gray-breasted Tree Duck which had been killed at Anegado Lagoon, on December 17, 1943, by a local hunter of Ponce—Lcdo. Carlos E. Colón. As far as I am aware this constitutes the second positive record of this rare species in Puerto Rico. Wetmore (1927: 307) did not secure specimens during his ornithological survey. Bond (1936: 38) included Puerto Rico in the geographical range of this species. Danforth (1936: 35) states that it is a resident species breeding in the thick aquatic vegetation of Cartagena Lagoon. He obtained a female specimen collected at Añasco by a hunter on October 16, 1937 (Auk, 55: 668, 1938).

This constitutes the second positive record of the occurrence of the Gray-breasted Tree Duck in Puerto Rico, where, according to my observations, it is extremely rare.

Anas acuta tsitsihoo Vieillot, PINTAIL.—One male, testes rather large, Anegado Lagoon, February 8, 1939 (Ramos); one female, ovaries small, Anegado Lagoon, December 17, 1939; one male, one female, Loiza, January 21, 1940 (Ramos); one male, one female, Añasco, February 1, 1941. These specimens, now on deposit at the Museum of Zoology of

the College of Agriculture at Mayaguez, were collected by Prof. J. A. Ramos and his associate in the College of Agriculture and Mechanic Arts. They appear to present the first records of the presence of the Pintail in Puerto Rico. Previous records seem to be conflicting as they are based only on sight observations since the days of Gundlach. Danforth (1925: 37) observed the Pintail on several occasions at Cartagena Lagoon but he never collected specimens. Bond (1936: 51) included Puerto Rico in the geographical range of the Pintail, probably following Danforth's sight records.

Anas carolinensis Gmelin, GREEN-WINGED TEAL.—On January 8, 1945, I saw four skins of the Green-winged Teal at the house of Mr. Rafael Rivera Esbrí in Ponce, Puerto Rico. He killed all four birds in Guánica Lagoon on December 16, 1944, according to his testimony. This species has not yet been reported from Puerto Rico. Wetmore (1927: 306) did not mention it from Puerto Rico. Bond (1936: 52) stated that it is a rare winter migrant in the West Indies and did not include Puerto Rico in its winter range. Danforth (1925: 39) never saw it in this country.

Erismatura dominica (Linnaeus), MASKED DUCK.—The following specimens are in the Museum of Zoology of the College of Agriculture, Mayaguez, P. R.: One female, ovaries small, Guánica Lagoon, February 12, 1943; one male, testes rather large, Anegado Lagoon, January 30, 1944; one male, testes enlarged, Añasco, October 21, 1943 (Ramos); one female, ovaries rather large, Anegado Lagoon, January 30, 1944 (Biaggi); one male, testes rather large, Guánica Lagoon, January 27, 1946 (Ramos).

Mr. Luis Santos from Añasco, P. R., possesses a mounted female specimen which was collected at La Cippiana, a small fresh-water swamp close to Central Igualdad in Mayaguez, in November, 1941.

The Masked Duck has been considered exceedingly rare in Puerto Rico and very few skins of this species have been collected here. Neither Wetmore (1927) nor Danforth (1925) succeeded in obtaining specimens during their ornithological surveys in Puerto Rico. Wetmore states, "formerly of rare occurrence in Puerto Rico; now perhaps extinct." Gundlach, according to Wetmore, recorded skins in the collections of Hjalmarson, Blanco and Stahl, taken in Arecibo and San Juan. Danforth (1936: 42) states that many years ago it was found in the island, but for many years there is no local record of the species.

Probably at a recent date, the Masked Duck may have invaded Puerto Rico from some of the neighboring islands, particularly from the Dominican Republic where it seems to be found in considerable numbers, although Wetmore and Swales (Birds of Haiti and the

Dominican Republic: 107, 1931) say that in the Dominican Republic it is apparently rare.

Fulica americana americana Gmelin, AMERICAN COOT.—The following specimens deposited in the Museum of Zoology of the College of Agriculture, Mayaguez, Puerto Rico: One female, ovaries slightly enlarged, Anegado Lagoon, November 3, 1939 (Ramos); one male, testes small, Cartagena Lagoon, January 13, 1941 (Ramos); one male, one female, Guánica Lagoon, February 12, 1943.

Accounts of the occurrence of the American Coot in Puerto Rico have been based mainly on sight records since the days of Gundlach and Stahl. No authentic records have been obtained since the above-mentioned specimens were collected by Prof. José A. Ramos and his associates in the College of Agriculture and Mechanic Arts. For many years the Puerto Rican Coot (*Fulica caribaea*), according to Wetmore, was listed as the present species, being confused erroneously with the American Coot because of the almost identical appearance of both birds, even at short distances. Danforth (1936) did not include the American Coot in his list of the birds of the island. Bond (1936: 94) did not include Puerto Rico in the winter range of this species. These records, therefore, stand as the first positive evidence of the occurrence of the American Coot in Puerto Rico.

Zenaidura macroura macroura (Linnaeus), CUBAN MOURNING DOVE.—The only record of the Cuban Mourning Dove in Puerto Rico (Barnés, 1936: 351) is of a single specimen collected at Salinas de Guánica on July 16, 1935, and included in Danforth's work (1936). During recent years since the discovery of this dove on the island, I have found it to be fairly abundant in the dry, cactus-covered area in the vicinity of Faro de Cabo Rojo, where local hunters bag them in fairly large numbers during the open season for doves. Prof. J. A. Ramos and his associates in the College of Agriculture, corroborate this statement.

The following specimens are on deposit in the Museum of Zoology of the College of Agriculture: One adult male, collected at Faro de Cabo Rojo, May 11, 1941; two immature (non-sexed) collected on July 29, 1942 (no locality). It is our belief that this dove is getting a good foothold in this particular section of the island, becoming well established on the more arid regions of the southwestern littoral.

Oreopeleia montana montana (Linnaeus), RUDDY QUAIL DOVE.—It is of interest to report a perfect albino example of the Ruddy Quail Dove taken by Prof. Ramos at Las Marías on August 21, 1941. The specimen is on deposit in the Museum of Zoology of the College of Agriculture, Mayaguez.

Asio domingensis portoricensis (Ridgway), PUERTO RICAN SHORT-EARED OWL.—The Puerto Rican Short-eared Owl is a rare bird on the island and accidentally encountered in the more swampy areas of the southwestern corner, where it feeds and breeds among the thick, low vegetation of swamps and lagoons. It is a bird of nocturnal habits—with which very few people are acquainted on the island—only those living close to its feeding and breeding grounds. On July 14, 1935, I collected two specimens, male and female, at a small, swampy area in the vicinity of Añasco. I presented these birds to the American Museum of Natural History. Since this particular occasion I have not seen this owl during my field trips to different sections of the island where it is supposed to be found.

Recently, when looking over the collections of the Museum of Zoology of the College of Agriculture at Mayaguez, I noticed two specimens of this owl, an adult female, obtained in the southern shore of Anegado Lagoon, on August 8, 1942, and one male collected at the same locality on August 11, 1942.

Dendroica palmarum hypochrysea Ridgway, YELLOW PALM WARBLER.—Prof. José A. Ramos informed me that on several occasions during the last days of September and the first days of October, 1943, he saw the arrival of this warbler on the College Campus. He clearly detected the deep golden yellow underparts which form one of the outstanding distinguishing characters of *hypochrysea*. As this would constitute the first record of the Yellow Palm Warbler in Puerto Rico, I include it in the list of hypothetical birds until specimens can be collected.

Dendroica tigrina (Gmelin), CAPE MAY WARBLER.—Danforth (Los Pájaros de Puerto Rico: 142, 1936) states that the Cape May Warbler is very rare on migration in Puerto Rico; he observed it on only six occasions in twelve years. However, we found it to be one of the most common migrants in the higher mountains that are well covered with dense, luxuriant vegetation. It was recorded as one of the most abundant species during the winter seasons of 1941, 1942, and 1943, in the eastern section of the mountains of Maricao. In the Dominican Republic (Wetmore and Swales 1931: 373) it is a very common winter migrant.

Helmitheros vermivorus (Gmelin), WORM-EATING WARBLER.—I was informed by Prof. Ramos and some of his associates in the Museum of Zoology of the College of Agriculture, that they saw one individual at the College grounds on October 15, 1943—the day after a small hurricane had passed across the western end of the island. He states that he is absolutely positive about his determination but I have included it in the hypothetical list until specimens can be collected. Bond

(Birds of the West Indies: 329) included the West Indies as winter range, but did not specifically mention Puerto Rico.

Wilsonia citrina (Boddaert), HOODED WARBLER.—An adult male was collected at Barrio Miradero, Mayaguez, on November 11, 1942 (Ramos). The specimen is on deposit in the Museum of Zoology of the College of Agriculture, Mayaguez. This constitutes the first authentic record of the occurrence of the Hooded Warbler in Puerto Rico. Bond (1936: 347) states this to be "rare on migration in the West Indies and only recorded from Cuba, Jamaica, and the Bahamas, from Cayo Lobos."

Icterus icterus ridgwayi (Hartert), TROUPIAL.—The Troupial, which was known to be a common bird in Puerto Rico many years ago, according to Gundlach, was supposed to be extinct until 1935 when specimens were obtained by Danforth and Barnés in the vicinity of Guánica and La Parguera, to which particular area the bird seems to be restricted. Since then Prof. Ramos and his associates have found the species to be increasing and extending its local range. At present it is moderately common from Lajas to Ensenada, whence they have records. I found it well established and tolerably common in the vicinity of Boquerón and Puerto Real, where it is frequently found in the mangrove growth along the coast.

Specimens in the Museum of Zoology of the College of Agriculture are: One male, Experiment Station grounds, May 2, 1941; one male, Ensenada, August 1, 1941 (Ramos).

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A SYSTEMATIC STUDY OF THE MAIN ARTERIES IN THE
REGION OF THE HEART—AVES XIV
GRUIFORMES, PART 2¹

BY FRED H. GLENNY²

INTRODUCTION

ACCORDING to Peters (1934), *Rhynchotos jubatus* J. Verreaux and Des Murs, is confined to New Caledonia. But one species of the genus is known, and this is said to be threatened with extinction.

Peters places *Rhynchotos* with the Gruiformes, Suborder Rhynchoti, Family Rhynchotidae.

Inasmuch as it is a rather singular form, from a taxonomic point of view, this writer feels that perhaps an anatomical note dealing with the species should be kept apart from a consideration of other forms despite the fact that basic ordinal characteristics may be present.

The writer wishes to present the characteristic arrangement-pattern of the main arteries in the region of the neck and thorax of birds as an aid to the better understanding of trends in the anatomical development of the various families and orders. It is not the purpose of this paper, however, to make any attempt to draw conclusions with regard to the degree or extent of divergence within the order, nor to discuss minor similarities and dissimilarities with other members of the order.

MATERIALS

Two specimens of *Rhynchotos jubatus* were obtained from the alcoholic collection of the United States National Museum (No. 288537 and No. 288538) and dissected and diagrams of the arterial arrangement-pattern prepared.

The writer wishes to express his gratitude to Dr. Alexander Wetmore and Dr. Herbert Friedmann for their coöperation in making possible this and other studies on specimens which are either rare or difficult to obtain.

OBSERVATIONS

Arising from the left ventricle of the heart and passing anteriorly and diagonally toward the right is the aortic root (1) which divides almost immediately to form the two innominate (2) arteries of the adult bird. The right innominate sends off the right 4th aortic arch (4) which maintains its connection with the right radix aortae (5) and passes posteriorly and diagonally to the left until it comes

¹ Contributions from the Blue Sea Lake Biological Laboratory, Messines, P. Q.

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to lie in a dorso-medial position within the thoracic cavity. At the junction with the dorsal aorta (7) the ligamentous vestige of the left radix aortae is found as a prominent ligamentum aortae (3) which may possess a partial lumen or may be entirely occluded. Only the posterior third of this vessel remains as a prominent structure, while anteriorly it remains as a thin, widened band of ligamentous tissue in the supporting fascia.

Along the ventro-lateral face of the right radix aortae, the ligamentum botalli (6) is found as a persistent though much reduced and atrophied vestige of the ductus botalli. Its proximal attachment may be maintained by an almost inconspicuous thread between the right systemic arch region and the right pulmonary artery (8).

Anteriorly, the innominate divide to form the subclavian artery (9) and the short common carotid artery (10). The right thyroid artery (11) arises from the right common carotid artery near its origin from the innominate, while the left thyroid artery (11) arises variously from (a) the innominate artery, or (b) from the base of the left common carotid artery.

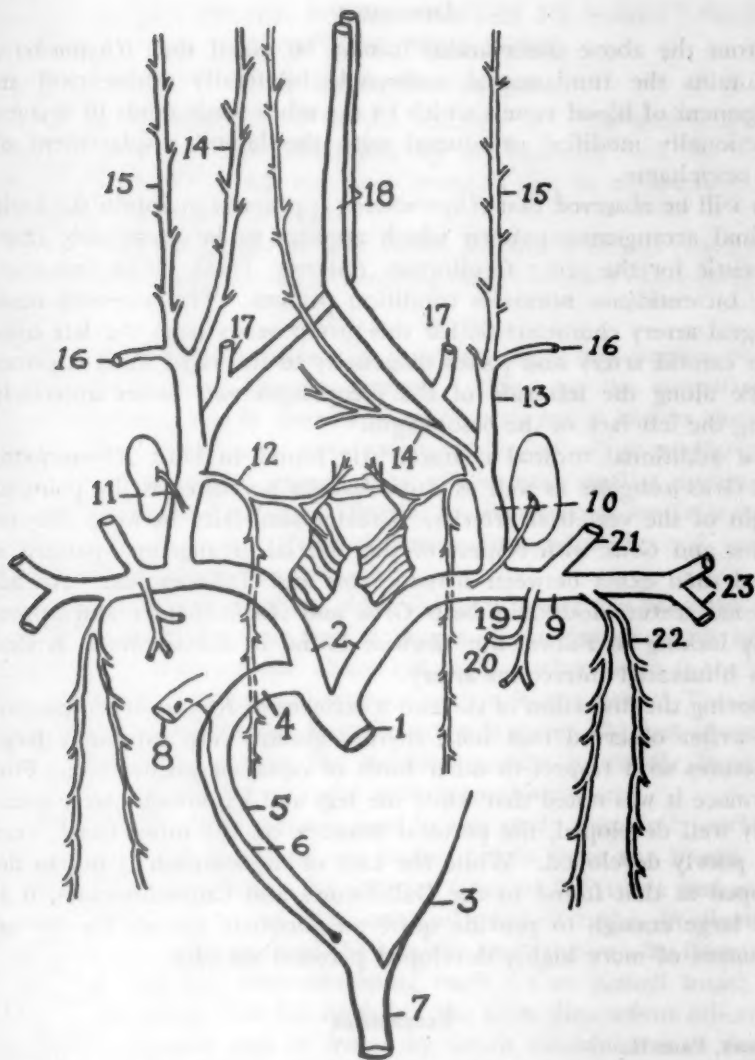
Both left and right ductus shawi (12) arise as very small vessels from the dorso-lateral face of the common carotids, and send very minute branches to the oesophagus and trachea before passing posteriorly to send branches to the bronchi, and other tissues of the dorsal thoracic region.

The superficial cervical arteries (13) arise from the common carotids and give rise to the ascending-oesophageal arteries (14), the lateral superficial cervical arteries or comes nervi vagi (15), and the subscapular arteries (16). Just anterior and slightly medially, the vertebral arteries (17) have their origin near the base of the internal carotid (trunk) arteries (18) which then enter the hypapophysial canal to pass anteriorly to the head.

Within the hypapophysial canal these two vessels remain unfused, with the left vessel lying ventral to the right internal carotid.

Laterally, the subclavian (9) sends off the coracoid major (19) which gives rise to the sternotracheal artery (20) before sending off branches to the coracoid muscle.

Next in origin is the axillary artery (21) which arises from the anterior face of the subclavian. On the posterior face of the subclavian and just lateral to the axillary, one may locate the intercostal artery (22) which divides into ventral and lateral branches to supply the intercostal muscles. Finally two, much reduced, pectoral arteries (23) arise from the distal end of the subclavian artery.



TEXT-FIG. 1. DIAGRAM OF MAIN ARTERIES IN THE NECK AND THORAX OF
Rhynochetos jubatus. VENTRAL VIEW.

KEY TO ABBREVIATIONS.—1, Aortic root; 2, innominate arteries; 3, ligamentum aortae; 4, systemic (4th aortic) arch; 5, right radix aortae; 6, ligamentum botalli; 7, dorsal aorta; 8, pulmonary artery; 9, subclavian artery; 10, common carotid artery; 11, thyroid artery; 12, ductus shawi; 13, superficial cervical artery; 14, ascending oesophageal artery; 15, lateral superficial cervical artery; 16, subcapular artery; 17, vertebral artery; 18, internal carotid (trunk) artery; 19, coracoid major artery; 20, sternotracheal artery; 21, axillary artery; 22, intercostal artery; 23, pectoral artery.

DISCUSSION

From the above observations it may be noted that *Rhynochetos* maintains the fundamental embryonic bilaterally symmetrical arrangement of blood vessels which in the adult birds tends to become functionally modified or altered with the lateral displacement of the oesophagus.

It will be observed that *Rhynochetos* appears to maintain the basic ordinal arrangement-pattern which appears to be reasonably characteristic for the order Gruiformes (Glenny, 1945). The characteristic bicarotidinae normales condition persists. The accessory oesophageal artery characteristic for this group arises from the left common carotid artery and passes diagonally to the right until it comes to lie along the left side of the oesophagus and passes anteriorly along the left face of the oesophagus.

An additional ordinal characteristic found in both *Rhynochetos* and *Grus antigone* as well as *Anthropoides paradisea* is the point of origin of the vertebral arteries. Greater similarity between *Rhynochetos* and *Grus* with respect to the arterial arrangement-pattern is noted than exists between *Rhynochetos* and *Anthropoides*. An additional feature found in both *Grus* and *Anthropoides* and apparently lacking in *Fulica*, but likewise found in *Rhynochetos*, is that of a bifurcated intercostal artery.

During the dissection of the two specimens of *Rhynochetos jubatus*, the writer observed that both thyroid glands were extremely large structures with respect to other birds of equal or greater size. Furthermore it was noted that while the legs and leg muscles were seemingly well developed, the pectoral muscles, on the other hand, were but poorly developed. While the keel of the sternum is not so developed as that found in the Galliformes and Columbiformes, it is still large enough to provide quite an adequate surface for the attachment of more highly developed pectoral muscles.

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USE OF ARTIFICIAL NESTING SITES BY VIOLET-GREEN AND TREE SWALLOWS

BY GORDON W. GULLION

THIS study was started in the summer of 1939 and continued through 1942; it was interrupted by my entrance into the armed services in 1943. It has not been resumed due to my moving from the locality in which it began.

I owe grateful thanks to Mrs. Helen Kilpatrick of this city for her work in banding many of the breeding birds and most of the nestlings.

GENERAL NOTES

This study was conducted on the property of my parents on the eastern outskirts of Eugene, Oregon. The property, consisting of about one acre, was in lawn with many ornamental shrubs clustered about. The larger trees were mostly white oak, *Quercus Garryana*, and broad-leaf maple, *Acer macrophyllum*; with smaller numbers of black oak, *Quercus Kelloggi*; Douglas fir, *Pseudotsuga taxifolia* (transplanted); Sitka spruce, *Picea sitchensis* (transplanted); and incense cedar, *Libocedrus decurrens*.

The eastern and northern sides of the property are bounded by a cliff of about twenty-five feet in height. Immediately north of the property is a millrace and about 100 yards farther north is the sluggish Willamette River. The whole area is in the humid Transition Zone of western Oregon. Our elevation is about 425 feet above sea level. The wind during the summer months is usually from the northwest, but all storms come with a southwest wind.

The artificial nesting boxes used in this study were fully enclosed, with a 5 x 5-inch floor and ten inches height from the lowest part of the roof to the floor. An interior space of 250 cubic inches was thus provided. A round hole, one and one-half inches in diameter, was centered in the front of the box five inches above the floor. All but two boxes had forward-sloping roofs. Two placed under the eaves of the garage had flat roofs but the same dimensions otherwise. All had removable tops or fronts by which examination of the interior could be made. All boxes were made of rough-cut Douglas fir lumber and were stained or painted to match their background as nearly as possible.

Twenty-three boxes were used. They were from ten to fifteen feet above the ground. All but six of these were placed on white oak trees. One was on a black oak, one on a broad-leaf maple, one on a power pole and three on the residence. Most of the boxes faced from northwest to east. Only five faced in a southerly direction.

All boxes were free of obstructions for at least ten feet directly in front, and most were free for several feet on both sides, top and bottom. Eleven boxes faced on open areas at least fifty feet across, with no overhanging trees, and the rest of the boxes had obstructions, of one nature or another, to vertical approach.

NESTING BEHAVIOR

Both species of swallows concerned in this study are quite common throughout western Oregon from April until September. The Violet-green Swallows, *Tachycineta thalassina lepida*, arrive first in this area (my earliest date is March 10) and the Tree Swallows, *Iridoprocne bicolor*, come about two weeks later (my earliest date is March 17).

The Violet-green Swallows at first seemed to be less concerned with serious nesting than the later-arriving Tree Swallows. The Violet-greens came into the nesting area a week or so after their arrival in the general vicinity and began to bicker lightly about nesting sites. This continued without serious attention until about the middle of April when they finally paired off, selected one or two suitable boxes and began to fill them with various assorted nesting materials.

The Tree Swallows, on the other hand, were generally first seen every year when a pair was found warbling over a desirable site. They apparently came into the nesting area almost immediately upon their arrival from the south and began seeking a favorable site.

The Tree Swallows did not fill boxes with such an abundance of material as did the Violet-greens, nor did they fill two boxes at once. When they had selected their box, they would set about earnestly building a nest from the bottom up. The Violet-greens, on the other hand, usually filled two adjacent boxes about one-quarter full and not until after copulation did they settle down to one box.

The Violet-green Swallows' habit of partially filling two boxes was not, however, a wasted effort. This species quite frequently nested twice in one season, and the second nest would be in the unused, partially filled box left during the first period. Often a second set of five or six eggs would be in the second box before the first brood had left its nest. I further suspected, but never proved, that the second box was used by the non-incubating mate during the nesting period as a shelter and resting place.

Though both species frequently reared two broods a year, I do not recall one pair using the same box twice in one season. Sometimes a box used by one pair early in the season would be used by another pair, or even the other species, later, but this was rare.

Favorite bulk nesting material of both species was the lawn trimmings left by the lawnmower, with an interior finish of down feathers from domestic chickens, which I provided for them.

The Violet-green Swallows, though reluctant to begin nesting, were more serious about it once they began. They would usually flutter about the box while I examined it, and sometimes the females would not leave the box even when it was opened. The Tree Swallows usually left the nest on the least suspicion of danger or any disturbance. In both species the males were least concerned with the protection of the nest.

SELECTION OF NESTING SITES

This behavior was most interesting to watch. It was very similar to the international politics of that period and also of the present day. In areas where roomy vertical approach was not possible, each pair of swallows had to have a certain definite flyway from their nest to the open sky, and one pair would not tolerate the use of this flyway by another breeding pair. This seemed to be an interspecific requirement. This flyway requirement apparently had more to do with the choice of nest boxes than any other condition. The matter of facing into the weather or a local obstruction near the box seemed to be no hindrance to use if there were free access to the open air spaces. In cases where more than one nest box faced on one flyway, only one of those boxes would be used if a pair of Tree Swallows took possession first. At most, only two were used if the Violet-green Swallows were first in possession. For that reason, seldom more than eleven of the twenty-three boxes were occupied at one time by swallows. Slender-billed Nuthatches, *Sitta carolinensis aculeata*, and Western House Wrens, *Troglodytes aëdon parkmanii*, would use empty boxes without regard to flyway rights.

The flyway requirements of a pair seemed to be that the flyway be not more than fifty feet long nor less than eight feet wide and that there be no limbs or obstructions as low as or lower than the site of the nesting box. Furthermore, the flyway had to open into a large area from which the birds could climb into the sky in any direction.

These flyway requirements were more important than the proximity of nesting sites. In several places two boxes would be close together (five to ten feet) on the same tree but facing into different flyways. On several occasions both boxes were occupied by different pairs or species simultaneously without dispute.

The fact that a pair claimed one flyway for one brood was not assurance that they would not claim another for the second brood that same season. This was especially true of the Tree Swallows.

The second brood of a pair of Tree Swallows might be raised three flyways from the first or on the opposite end of the area. Nor were there certain boxes occupied by the same species each year except in the single case cited later in this paper. I stated earlier that one box might be used by both species in one season.

RETURN OF BANDED BIRDS

Mrs. Helen Kilpatrick, who banded the birds, has not reported returns on any of the birds. Nor did I find any during the succeeding year's work, with one notable exception. One female Violet-green Swallow returned each of the three succeeding seasons after being banded in 1939. The first two years she had the same mate and the second two years another steady mate. In all four years she used the same two boxes, producing two broods of four, five or six young, a season. I shall discuss this behavior in more detail in a later paper.

NESTING FAILURES

For the most part, nesting attempts were fully successful. Failure came more often to the Tree Swallows, but even there in less than ten per cent of the attempts. Only three times were nests containing live young deserted—twice by Tree Swallows and once by a pair of Violet-greens. One pair of Tree Swallows deserted a nest containing three newly hatched young and immediately set to work building another nest in which they were successful. Their reason for deserting the first was never understood. The second Tree Swallow nest was broken up by a male English Sparrow, *Passer domesticus domesticus*, shortly after the young hatched. The Violet-green Swallow nest, which was deserted after the four nestlings had begun to get their feathers, proved to be black, inside and out, with bird lice.

We were at fault in three or four cases in that we banded Tree Swallows at night. They immediately abandoned their nests under those conditions, and in all cases, nests of eggs were deserted. Violet-green Swallows did not abandon nests after being banded at night.

Throughout the nesting period I made strenuous efforts to protect the nests against stray cats, squirrels and English Sparrows. To the best of my knowledge, only the one Tree Swallow nest was broken up by any of those marauders.

Between nesting periods and between seasons all boxes were thoroughly cleaned, washed and disinfected. Despite this, all boxes contained lice by the time the nestlings were two or three days old. In addition to these lice, I commonly found an ectoparasitic larva on the Violet-green Swallows, a week or so after hatching. This para-

site caused a large number of the deaths among two-week-old nestlings. I removed them whenever I would find them, but I often missed a few. This parasite did not seem to bother the young Tree Swallows. I believe the use of DDT in future experiments of this type might free the nests of all parasites.

SUMMARY

1. The use of artificial nesting sites in the humid Transition Zone of western Oregon by Violet-green Swallows, *Tachycineta thalassina lepida*; and Tree Swallows, *Iridoprocne bicolor*, was studied over a period of four summers (1939 to 1942).

2. Twenty-three nesting boxes in various sites in close proximity were used.

3. Tree Swallows begin nesting sooner after arrival in the breeding area than the Violet-greens but are not as persistent.

4. Both species frequently rear two broods a season.

5. Pairs of both species require a certain amount of living space and will not tolerate intruders into their area. This is an interspecific requirement.

6. Most pairs do not use the same nesting site or locality in succeeding seasons.

7. Young birds do not seem to return to their natal homes.

8. The use of artificial nesting sites is highly successful for both species (80-85%).

9. Most nestling deaths are caused by invertebrate parasites (directly or indirectly) and predacious vertebrate marauders. (The use of DDT might eliminate the former.)

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BIRDS OF AGRIHAN

BY DONALD J. BORROR

BECAUSE of the scarcity of bird records from the northern Marianas, this brief account of the birds observed at Agrihan from July 27 to August 14, 1945, may be of some interest. The writer's visit to Agrihan was for the purpose of making a survey of the island; this survey was terminated rather abruptly, ahead of schedule, by the surrender of Japan and the writer's recall to his base at Saipan on August 14.

Agrihan is a small volcanic island in the northern Marianas, located about 200 miles north of Saipan at approximately 19° north latitude and 145° 30' east longitude. It is oval in shape, and about six miles long and four miles wide. The shore line is for the most part very rocky. The few beaches are composed of loose, black volcanic sand, and the rocks are of similar volcanic material; there is no coral rock present. Inland from a narrow coastal strip the land rises abruptly to an elevation of 3,166 feet, the highest elevation in the Marianas. The central part of the island is characterized by a series of sharp ridges alternating with steep-sided ravines, which radiate from the peaks in the center of the island to the shore line. Trees grow only on the low ground around the periphery of the island, and in some of the ravines up to an elevation of several hundred feet. Elsewhere the island is covered by a dense growth of kunai grass (*Imperata cylindrica*), a grass which grows several feet high and has very sharp-edged leaves. There are no permanent freshwater areas on the island; the ravines fill with water during a rain, but soon dry. The trees in the forest growth around the periphery of the island are mainly coconut (*Cocos nucifera*), with some breadfruit (*Artocarpus altilis*), papaya (*Carica papaya*), banana (*Musa* sp.), and other trees. The undergrowth in these wooded areas is usually very dense, and consists of vines, herbaceous plants, and ferns.

At the time of the writer's visit to Agrihan the rainfall was fairly heavy, and during a 12-day period in which a rain gauge was operating, the total rainfall was 216.2 mm.; this is at a rate of about 22 inches for a 31-day month. Temperatures ranged from 74° to 97° F., with an average of 83.5°.

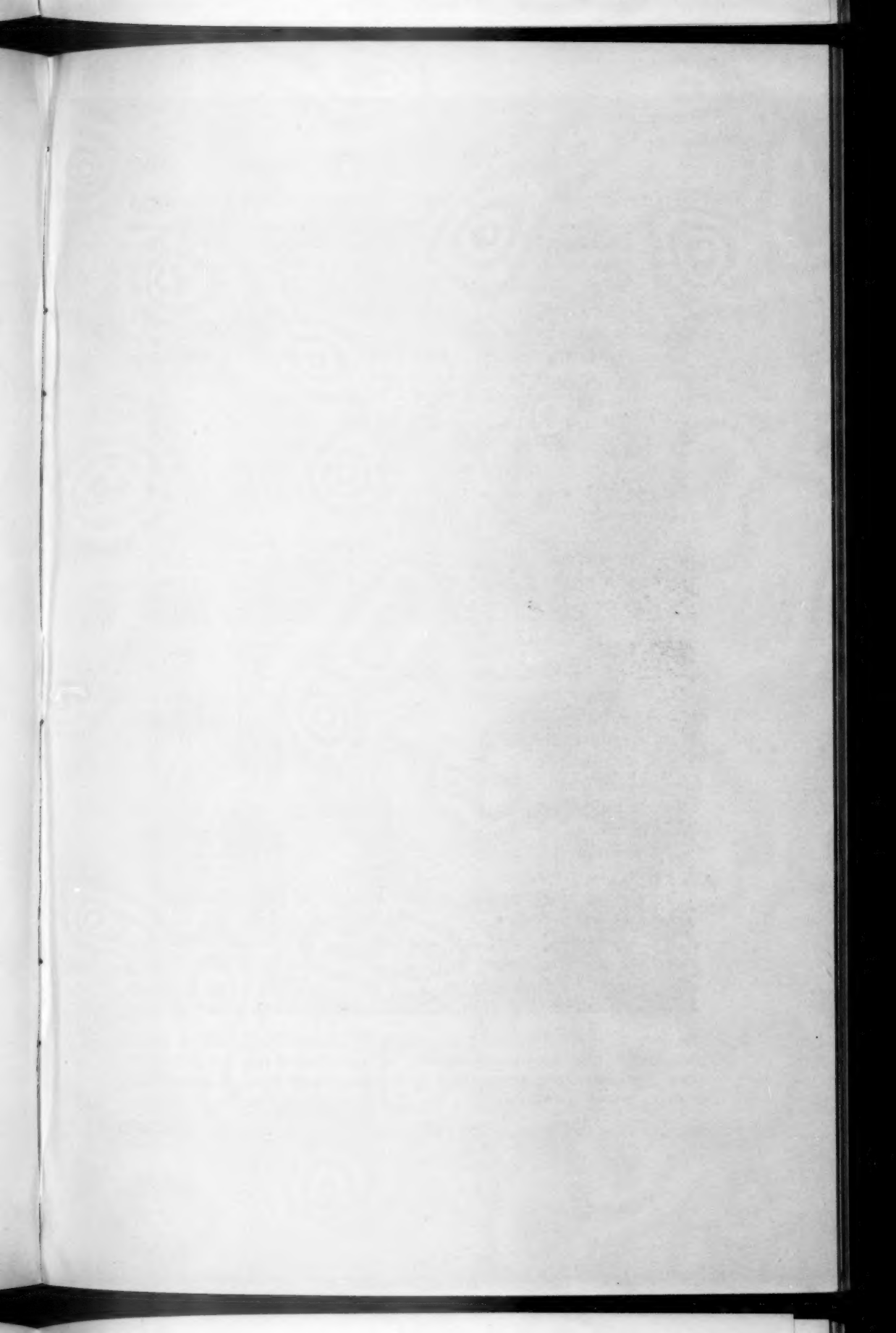
The writer's observations were confined to the lower areas in the southern third of the island. A number of birds were collected, but due to circumstances beyond the writer's control all the skins were lost during the latter part of August, 1945.

The nomenclature followed is from Ernst Mayr's 'Birds of the Southwest Pacific' (The Macmillan Co., 1945). Of the twelve species of birds observed at Agrihan, at least five appeared to nest there: the White-collared Kingfisher, Micronesian Starling, Cardinal Honey-eater, Fairy Tern, and Common Noddy. There is a possibility that two other species, the Reef Heron and the White-capped Noddy, may also nest on Agrihan.

LIST OF SPECIES

WHITE-TAILED TROPIC-BIRD (*Phaethon lepturus*).—Single individuals of this species were seen on three occasions, July 29, August 5, and August 6.

PACIFIC MAN-O'-WAR (*Fregata minor*).—Two of these birds were seen on August 11, flying in a southerly direction above the southwest shore of the island.





SPOTTED BUTTON QUAIL ON GUADALCANAL. (*Upper*) GRASSLAND HABITAT. (*Lower*) STREAMSIDE ASSOCIATION SHOWING ABRUPT CHANGE FROM GRASSLAND TO FOREST. THE SPOTTED BUTTON QUAIL WAS SEEN MOST OFTEN IN THE GRASS EDGES IN THE FOREGROUND.

REEF HERON (*Demigretta sacra sacra*).—This species was seen along the rocky shore of the island on several occasions; all the individuals seen were of the gray phase.

FAIRY TERN (*Gygis alba candida*).—This is a common and fairly abundant species, and probably nests in the trees at the base of the hills. It is highly prized for food by the natives. Two specimens were collected; the stomachs contained fish.

COMMON NODDY (*Anous stolidus pileatus*).—This is a common species, and appears to nest on the island. Two colonies were found, on cliffs in the southern part of the island. A female collected on August 10 had the following measurements (in inches): length, 16.0; wing, 11.0; bill, 1.6; tail, 6.8; and tarsus, 1.1; its stomach contained fish.

WHITE-CAPPED NODDY (*Anous tenuirostris*).—On August 11 several noddies were seen along the southwestern shore of the island which appeared to be this species; they were smaller and darker than the Common Noddies, and had more white on the head.

PACIFIC GOLDEN PLOVER (*Pluvialis dominica fulva*).—Two individuals were seen on August 10, on a beach along the southwestern shore of the island.

WANDERING TATTLER (*Heteroscelus incanus*).—This species was seen along the beaches on two occasions, August 2 and August 12.

TURNSTONE (*Arenaria interpres*).—Small flocks of Turnstones were seen along the beaches on August 10 and August 11.

WHITE-COLLARED KINGFISHER (*Halcyon chloris owstoni*).—This is a common and abundant species, and probably nests on the island. Two specimens were collected; the stomachs contained grasshoppers.

MICRONESIAN STARLING (*Aplonis opacus aeneus*).—This is a common and abundant species, and probably nests on the island. One specimen was collected; its stomach contained a grasshopper.

CARDINAL HONEY-EATER (*Myzomela cardinalis saffordi*).—This is a common species, and probably nests on the island. One specimen was collected; the stomach contents were not recognizable.

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FIELD OBSERVATIONS ON THE SPOTTED BUTTON-QUAIL ON GUADALCANAL

BY ROBERT C. PENDLETON

Plate 14

MAYR (1945: 58), in his 'Birds of the Southwest Pacific,' gave a description of the Spotted Button-Quail (*Turnix maculosa*) and stated: "Most field naturalists will look in vain for these elusive birds, even in their proper habitat." He also said (op. cit.: 219): "The subspecies *salomonis* Mayr 1938 is known only from a single bird from the grasslands of Guadalcanal. The building of airfields in these grasslands may seriously have threatened the existence of this race."

While in the Medical Corps of the U. S. Navy, the writer spent eleven months on Guadalcanal. His duties consisted, mainly, of

field malaria control and gave opportunity to be in the field eight to ten hours daily. This field survey work, much of it in the grassland habitat of *Turnix maculosa salomonis*, gave many chances to observe this interesting species, but, unfortunately, made searching for nests and protracted life-cycle studies impossible. Because of the lack of information pertaining to this species, however, the following notes are offered.

The area on which the study was made is typical of all the northwestern coastal plain of Guadalcanal. The plant communities in this area are: rain forests bordering the streams and covering the highlands above the fog line, mangroves at the river mouths, strand associations following the shore line, and grasslands occupying the areas behind the strand associations and between the rivers back to, and in many places well up, the hillsides. Large coconut groves (*Cocos nucifera*) have been planted in several places. This area lies east of the Little Tenaru River about two miles inland from the coast. Many field trips were taken beyond the limits of this area approximately three miles inland in all directions. Because this area had been a scene of battle, and later a bivouac area, large areas of grass had been destroyed, but this was growing back in a mixed shrub-herb-grass community.

There was one area of about three-quarters of a square mile of comparatively unharmed grasslands. The grass in this area was four to six feet in height and so dense and interwoven that passage through it was extremely difficult. In the shadow of the rain forest along the streams the grass in some places was shorter and less dense. This was true also in the densest parts of the coconut groves, but in many places the grass grew well into the groves.

On October 10, 1943, the Button-Quail was first seen when two were flushed simultaneously from the short grass near the edge of a coconut grove. This was the only time that two of the birds were observed together, possibly indicating that the birds are solitary much of the time. Individuals were observed repeatedly in this area and in near-by shrub-herb-grass communities throughout the writer's stay on Guadalcanal.

All the Button-Quails observed were seen at the edges of the grass areas. None were seen in the tall grass, but this may be due to the impossibility of seeing the elusive creatures in such dense cover. If disturbed, the bird would, of necessity, have either to run ahead or to 'freeze' since flight through this tangle would be almost impossible.

Five Button-Quails were seen during one day of survey work, indicating that the bird is more secretive than rare. These observa-

tions were made over widely scattered areas during the work of searching in the grass for shell holes and bomb craters which, filled with water, are a potential source of malarial mosquitoes.

This species is active only in the cool of morning and the late afternoon shortly before sunset. During these hours individuals were seen wandering about in short-grass areas (areas where the natural stand had been cut short near camps), but all mid-day observations were of forced flights or flushes.

While feeding, the bird progresses by a series of short walks or nervous runs, stopping often to look about or listen. The head, almost constantly in motion, is held low while the bird is moving, but is often raised nervously, interrupting feeding. It was most difficult to follow the bird in its feeding because of its coloration, so perfectly advantageous for hiding in the dry grass. The orange-brown of the sides blends perfectly with the grass culms while the spotted, gray back melts into the gray soil. The exact food taken was not determined, but much of it was secured from the ground at the bases of grass clumps.

When approached, the Button-Quail first attempts to run, but when surprised or pressed it 'freezes,' and when motionless it is almost impossible to see. The writer has lost sight of one less than a yard away, so perfect is the coloration and control, and several times has spent ten or more minutes standing with the bird within a foot of his feet. The yellow bill is often the only portion than can be plainly discerned.

Flight would appear to be a last resort, often not being used until there is actual danger of being crushed or until a sudden, quick movement is made toward the place of concealment. The bird rises with a slight whirring of wings, and its flight is fairly swift, but of short duration. Seldom is the flight higher than the minimum necessary to clear the grass, and is usually for a distance less than twenty yards. In general the individuals observed followed a definite flight pattern in the nature of an uneven arch, grading slowly upward from origin and dropping sharply at the end. Usually the flight was a curve to right or left with a sharp increase of the curve just before landing. After landing, a short run was usual at an angle to the line of flight. This habit of running after flight was observed several times when the bird flushed in grass that had recently been cut, thus making the whole flight pattern observable.

Throughout the studies, no actual cases of predation upon the Button-Quail were observed, but several predators hunt in or near the grassland habitat. Undoubtedly these are a part of the predators with which *Turnix* must cope. These predatory forms are as follows:

The Rufous Breasted Hawk (*Accipiter novaehollandiae pulchellus* Ramsay) frequents the rain forest along the edges of the grassland, and was often seen in the coconut groves near places where many observations of the Button-Quail were made. On one occasion this hawk was seen eating a freshly killed bird identified by sight as a Willie Wagtail (*Rhipidura leucophrys melaleuca* Quoy and Gaimard).

The White and Red Eagle-Kite (*Haliastur indus girrenera* Vieillot), although primarily a bird of the seacoast, hunts over the rain forest, coconut groves, and grasslands. It was common to see a pair of these striking hawks circling over the rain-forest stream belt and near-by grassland.

An unidentified owl, brown above, rufous to buff-breasted with moderate spotting of the breast, and about the size of the Western Short-eared Owl was seen several times in the edges of the rain forest and in the coconut groves.

The monitor lizard (*Varanus indicus* Daudin) was common in the rain forest, coconut groves, and edges of the grassland. Its stealth and speed over short distances make it a dangerous predator for small animals, and its presence in the grassland habitat probably indicates that it preys upon the Button-Quail. It was actually observed catching a rat in the grass.

Two snakes [*Boiga irregularis* and *Enygrus carinatus*, as identified from Burt and Burt (1935: 54-65)] were collected in the rain forest bordering the grasslands. These reptiles were not observed in the grass, but their presence within a few feet of the areas apparently most frequented by the Button-Quail is thought to be significant.

Rats have been observed in the grasslands of Guadalcanal. They are quite numerous in and near military storage and bivouac areas there, but whether or not they will multiply and repeat the havoc wrought on Lord Howe, Laysan, Midway, and other Pacific islands only future studies will show.

The domestic cat has been introduced on Guadalcanal by military personnel, and many will probably be left when the island is evacuated. It will be of interest to see whether this species will adapt itself to the heat, humidity and periodic flooding of the tropics.

Despite the presence of new predators and the destruction of a portion of the grassland, it is the writer's opinion that the Spotted Button-Quail is not in any immediate danger of extinction. The secretive habits of this species augur well for its success in partially eluding the domestic cat, thus leaving the rat as the most questionable factor. It is also pertinent to note that the biotic complex of

Guadalcanal is quite different from that of Laysan Island or Midway where the Laysan Rail has been exterminated (Baldwin, 1945). The presence of native raptors, both nocturnal and diurnal in habits and of sufficient size to take rats, is cause for hope that rats may be kept in check or at least impeded in their occupation of the island.

As to the influence of man, it appears that the Spotted Button-Quail is able to live near man as shown by numerous observations of individuals within thirty yards of camp areas over a period of ten months. Compared with the whole area, the amount of grassland destroyed or occupied by the building of airfields, roads, bivouac areas, and ammunition dumps is insignificant. Several flights in aircraft over the northwest coastal plain of Guadalcanal showed that the major portion of this area from the Kema River to Cape Esperance, a distance of approximately fifty-five miles, with an average depth of three miles, is a steppe region in which only the areas belting streams running through the plains, a narrow strand association, a few large coconut groves, and a few low swampy areas are wooded. Presumably all the rest of this area is habitable by the Spotted Button-Quail.

SUMMARY

Observations of the Spotted Button-Quail, *Turnix maculosa salomonis*, of Guadalcanal Island indicate that it is an inhabitant of the large grassland area that occupies the major portion of the northwest coastal plain. Within this habitat, it occupies the ground stratum, feeding among the bases of the grass clumps. When disturbed, it either seeks cover, 'freezes,' or makes short flights over the grass tops. It lives in a biotic complex which includes hawks and owls overhead and domestic cats, rats, snakes, and monitor lizards on the ground. Since only an insignificant portion of the available grassland habitat has been destroyed or occupied by military forces, it is believed that the Spotted Button-Quail is not in any immediate danger of extinction.

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DUCK WEIGHTS IN ILLINOIS

BY FRANK C. BELLROSE AND ARTHUR S. HAWKINS

A STUDY of the weights of ducks migrating through Illinois was undertaken (1) to discover whether there was basis for the contention of some Illinois hunters in 1938 that many ducks were in poor flesh or were "starving"; (2) to determine the weights of various species; (3) to ascertain the validity of reports concerning Mallards and Black Ducks weighing four or five pounds each. As part of the study, 4,979 ducks were weighed in 1938 to 1940. Acknowledgement is made to Drs. Herman and Elizabeth Brown Chase for statistical analysis.

MEASURING WEIGHTS OF DUCKS

Within each duck species, weights varied according to the age class (juveniles or adults), sex, wetness of feathers, amount of food in the crop, and the amount of blood lost. We recorded the approximate crop content and wetness of feathers but found it impractical to correct weight data for these variables or for the loss of blood. Wet and dirt-matted feathers added about two per cent to the over-all weights.

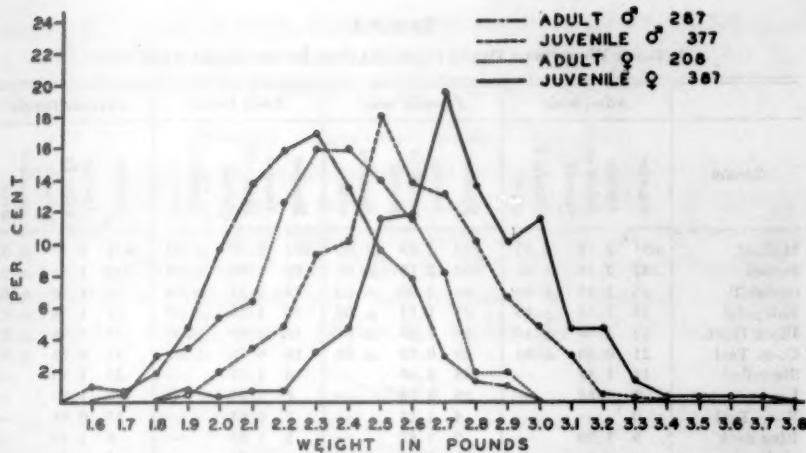
In 1938, the first year of the study, the cloacal method of aging ducks was unknown (Hochbaum, 1942). However, we classified many ducks as juveniles or adults by the presence or absence of notched tail feathers (Kortright, 1942); Gadwalls, Baldpates, Shovellers, and Lesser Scaups were species in which most juveniles retained their juvenal tail feathers. In 1939 and 1940, all ducks were aged by the cloacal method.

WEIGHTS

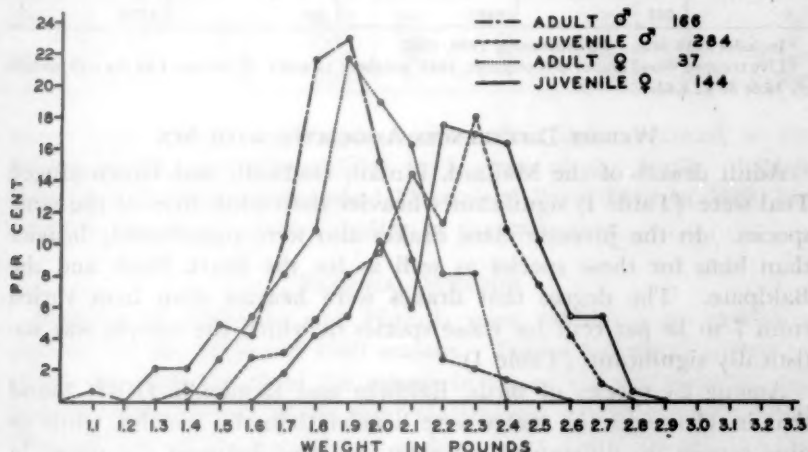
Apparently hunters, like fishermen, are prone to exaggerate the weight of their take, for we have heard reports of four- and five-pound Mallards and in a leading book on duck shooting, the author reports shooting eight Black Ducks "that must have weighed nearly five pounds apiece." Among the 3,261 Mallards that we weighed, the heaviest was 3.7 pounds. The distribution of Mallard and Pintail weights in 1940 are shown in text-figs. 1 and 2. Adult drake Black Ducks in Illinois averaged 2.65 pounds; the top weight among 69 individuals was 3.1 pounds.

We have noted that Mallards weighing over three pounds show characteristics similar to barnyard Mallards. It is our opinion, therefore, that most Mallards weighing more than three pounds are from, or related to, barnyard birds.

A comparison of the weights of different species of ducks is given in Table 1. The Canvas-back was apparently the heaviest of the spe-



Text-fig. 1. The weight distribution, by age and sex classes, of 1,259 Mallards shot in the Illinois River Valley, 1940.



Text-fig. 2. The weight distribution, by age and sex classes, of 631 Pintails shot in the Illinois River Valley, 1940.

cies weighed. Mallards and Black Ducks weighed about the same; both were significantly heavier than the Pintail in all sex and age classes. Gadwall weights were similar to those of Pintails except in the juvenile male class where Pintails were heavier. Baldpates averaged about one-fourth pound less than Gadwalls. Lesser Scaups weighed slightly more than Baldpates and slightly less than Gadwalls. The Green-winged Teal was the lightest of the species weighed.

TABLE 1
AVERAGE WEIGHTS OF DUCKS IN THE ILLINOIS RIVER VALLEY, 1938-1940

Species	Adult male			Juvenile male			Adult female			Juvenile female		
	Number	Average weight in pounds	Standard error	Number	Average weight in pounds	Standard error	Number	Average weight in pounds	Standard error	Number	Average weight in pounds	Standard error
Mallard	631	2.78	±.01	730	2.59	±.01	402	2.39	±.02	671	2.28	±.01
Pintail	237	2.28	±.02	403	2.15	±.01	60	1.96	±.03	219	1.84	±.02
Gadwall ¹	16	2.18	±.06	68	2.00	±.03	14	1.87	±.04	66	1.78	±.03
Baldpate ¹	19	1.78	±.05	82	1.72	±.03	16	1.66	±.05	92	1.58	±.02
Black Duck	12	2.65	±.10	18	2.59	±.07	10	2.40	±.09	29	2.35	±.05
G.-w. Teal	21	0.86	±.01	38	0.82	±.01	10	0.78	±.02	31	0.74	±.02
Shoveller ¹	16	1.52	—	45	1.48	—	6	1.37	—	35	1.30	—
Lesser Scaup ¹	9	1.85	—	26	1.78	—	6	1.72	—	27	1.73	—
B.-w. Teal	0	—	—	4	1.13	—	5	0.95	—	13	0.95	—
Ring-neck	9	1.90	—	9	1.62	—	5	1.53	—	6	1.45	—
Redhead	1	2.62	—	3	2.33	—	3	2.37	—	1	2.10	—
Wood Duck ²	4	1.53	—	5	1.57	—	0	—	—	4	1.22	—
Canvas-back	4	2.98	—	1	2.20	—	2	2.58	—	5	2.35	—
Ruddy Duck	3	1.35	—	0	—	—	2	1.21	—	0	—	—
	982			1432			541			1199		

¹ Includes 1938 data. All others only 1939, 1940.

² Live trapped Wood Ducks in September, 1943, weighed: 13 adult ♂, average 1.54 lbs.; 46 juvenile ♂, 14.6; 32 ♀, 1.42.

WEIGHT DIFFERENCES ASSOCIATED WITH SEX

Adult drakes of the Mallard, Pintail, Gadwall, and Green-winged Teal were (Table 1) significantly heavier than adult hens of the same species. In the juvenile class, drakes also were considerably heavier than hens for these species as well as for the Black Duck and the Baldpate. The degree that drakes were heavier than hens varied from 7 to 18 per cent for those species in which the sample was statistically significant (Table 1).

Among 24 species of birds, Baldwin and Kendeigh (1938) found that in 11 species the males were heavier than the females, while in nine species no difference in weight occurred between the sexes; in four species females were heavier than males.

WEIGHT DIFFERENCES ASSOCIATED WITH AGE

Adult ducks in most species weigh significantly more than juveniles in both drake and hen groups (Table 1). For species with a statistically significant sample, the degree that adults were heavier than juveniles ranged from 4 to 9 per cent, about half as much as differences in weight associated with sex.

Weight differences between juveniles and adults seem more pronounced in passerine and other small birds than in ducks. In 15

out of 19 species of birds, Baldwin and Kendeigh (1938) found that immatures were lighter than adults. Differences ranged from 3.5 per cent in sparrows to about 44 per cent in the Flicker.

WEIGHT VARIATIONS WITH LOCALITY

We investigated the possibility that weights varied by localities. Weights of Mallards were taken by Frederic Leopold in the Mississippi River Valley near Burlington, Iowa, in 1938 and 1939, as well as by us in the Illinois River Valley in 1938-1940. Ages of the ducks weighed near Burlington were not recorded, so we have compared weights only by sex classes (Table 2). Drake Mallards in the Illinois

TABLE 2
DIFFERENCES IN WEIGHT OF MALLARDS IN THE ILLINOIS AND THE MISSISSIPPI RIVERS VALLEYS

Year	Sex	Illinois River			Mississippi River			Standard error of difference	Probability
		Number	Weight	Standard error	Number	Weight	Standard error		
1938	♂	334	2.70	±.02	109	2.59	±.03	.04	.006
	♀	266	2.32	±.02	118	2.33	±.03	.04	.80
1939	♂	766	2.69	±.01	97	2.52	±.03	.03	<.0001
	♀	478	2.34	±.01	96	2.24	±.03	.03	.0009

River Valley were significantly heavier than those weighed in the Mississippi River Valley during both years of the study. Illinois River hen Mallards outweighed Mississippi River hens in 1939, but in 1938, hen weights were similar in the two areas.

SEASONAL WEIGHTS

Weights of Mallards and Pintails were tabulated by two-week periods for the 1939 and 1940 seasons. Tables 3-6 show a drop in weight the last period of the season in six of the eight Pintail age and sex classes and six of the eight Mallard age and sex classes. However, differences are so slight as to have little statistical significance. While there is no well-defined seasonal trend, there are seasonal differences which are statistically significant. These probably resulted from variations in feeding conditions and from differences in reaction of the sex and age groups to temperature and snow.

Elder (1946) reported that Canada Geese were also lighter in winter than during the fall months. Waterfowl appear to differ in this respect from small birds. Baldwin and Kendeigh (1938) found that weights of small birds were higher during the winter than during the fall or summer; their weight curves for both adult and juvenile passerine birds show a rapid rise from October through December.

TABLE 3
CHANGES IN WEIGHTS OF PINTAILS FROM OCTOBER 15 TO DECEMBER 15, 1939

Date	Age	Sex	Number	Average weight	Standard error	Standard error of difference	Probability
Oct. 15-Oct. 31	Adult	♂	32	2.35	±.07	.09	.89
Nov. 1-Nov. 15	Adult	♂	18	2.36	±.06		
Nov. 15-Nov. 30	Adult	♂	8	2.41	—		
Nov. 30-Dec. 15	Adult	♂	13	2.14	±.07		
Oct. 15-Oct. 31	Juvenile	♂	52	2.08	±.04	.07	.58
Nov. 1-Nov. 15	Juvenile	♂	24	2.12	±.06		
Nov. 16-Nov. 30	Juvenile	♂	23	2.21	±.05		
Dec. 1-Dec. 15	Juvenile	♂	20	1.99	±.04		
Oct. 15-Oct. 31	Adult	♀	7	2.04	—	.08	.61
Nov. 1-Nov. 15	Adult	♀	12	1.96	±.04		
Nov. 16-Nov. 30	Adult	♀	3	1.97	—		
Dec. 1-Dec. 15	Adult	♀	1	1.80	—		
Oct. 15-Oct. 31	Juvenile	♀	40	1.81	±.04	.10	.23
Nov. 1-Nov. 15	Juvenile	♀	17	1.85	±.07		
Nov. 16-Nov. 30	Juvenile	♀	12	1.73	±.07		
Dec. 1-Dec. 15	Juvenile	♀	6	1.90	—		

TABLE 4
CHANGES IN WEIGHTS OF PINTAILS FROM OCTOBER 15 TO DECEMBER 15, 1940

Date	Age	Sex	Number	Average weight	Standard error	Standard error of difference	Probability
Oct. 15-Oct. 31	Adult	♂	90	2.23	±.03	.04	.001
Nov. 1-Nov. 15	Adult	♂	48	2.36	±.03		
Nov. 16-Nov. 30	Adult	♂	25	2.19	±.04		
Dec. 1-Dec. 15	Adult	♂	3	2.47	—		
Oct. 15-Oct. 31	Juvenile	♂	132	2.14	±.02	.03	<.0001
Nov. 1-Nov. 15	Juvenile	♂	112	2.27	±.02		
Nov. 16-Nov. 30	Juvenile	♂	32	2.04	±.04		
Dec. 1-Dec. 15	Juvenile	♂	8	1.86	—		
Oct. 15-Oct. 31	Adult	♀	16	1.89	±.04	.06	.0001
Nov. 1-Nov. 15	Adult	♀	11	2.14	±.05		
Nov. 16-Nov. 30	Adult	♀	9	1.87	±.06		
Dec. 1-Dec. 15	Adult	♀	1	1.70	—		
Oct. 15-Oct. 31	Juvenile	♀	65	1.85	±.03	.04	.48
Nov. 1-Nov. 15	Juvenile	♀	68	1.88	±.03		
Nov. 16-Nov. 30	Juvenile	♀	9	1.80	±.07		
Dec. 1-Dec. 15	Juvenile	♀	2	1.70	—		

TABLE 5

CHANGES IN WEIGHTS OF MALLARDS FROM OCTOBER 15 TO DECEMBER 15, 1939

Date	Age	Sex	Number	Average weight	Standard error	Standard error of difference	Probability
Oct. 15-Oct. 31	Adult	♂	92	2.80	±.03	.04	.07
Nov. 1-Nov. 15	Adult	♂	100	2.87	±.02		.005
Nov. 16-Nov. 30	Adult	♂	80	2.76	±.03		
Dec. 1-Dec. 15	Adult	♂	72	2.77	±.03		.80
Oct. 15-Oct. 31	Juvenile	♂	52	2.55	±.03	.04	.19
Nov. 1-Nov. 15	Juvenile	♂	87	2.60	±.03		
Nov. 16-Nov. 30	Juvenile	♂	130	2.61	±.02		.80
Dec. 1-Dec. 15	Juvenile	♂	84	2.59	±.03		.62
Oct. 15-Oct. 31	Adult	♀	64	2.50	±.03	.05	.16
Nov. 1-Nov. 15	Adult	♀	41	2.43	±.04		.13
Nov. 16-Nov. 30	Adult	♀	44	2.34	±.04		
Dec. 1-Dec. 15	Adult	♀	45	2.38	±.05		.54
Oct. 15-Oct. 31	Juvenile	♀	63	2.28	±.03	.04	.62
Nov. 1-Nov. 15	Juvenile	♀	63	2.30	±.03		
Nov. 16-Nov. 30	Juvenile	♀	99	2.34	±.03		.31
Dec. 1-Dec. 15	Juvenile	♀	59	2.24	±.03		.01

TABLE 6

CHANGES IN WEIGHTS OF MALLARDS FROM OCTOBER 15 TO DECEMBER 15, 1940

Date	Age	Sex	Number	Average weight	Standard error	Standard error of difference	Probability
Oct. 15-Oct. 31	Adult	♂	66	2.82	±.03	.04	.006
Nov. 1-Nov. 15	Adult	♂	104	2.71	±.03		.23
Nov. 16-Nov. 30	Adult	♂	75	2.76	±.03		
Dec. 1-Dec. 15	Adult	♂	42	2.73	±.05		.62
Oct. 15-Oct. 31	Juvenile	♂	149	2.60	±.02	.04	.80
Nov. 1-Nov. 15	Juvenile	♂	114	2.59	±.03		
Nov. 16-Nov. 30	Juvenile	♂	66	2.47	±.03		.003
Dec. 1-Dec. 15	Juvenile	♂	48	2.62	±.03		.0002
Oct. 15-Oct. 31	Adult	♀	74	2.41	±.03	.05	.16
Nov. 1-Nov. 15	Adult	♀	52	2.34	±.04		
Nov. 16-Nov. 30	Adult	♀	51	2.34	±.03		.62
Dec. 1-Dec. 15	Adult	♀	31	2.31	±.05		.09
					first period		
Oct. 15-Oct. 31	Juvenile	♀	167	2.28	±.02	.03	.04
Nov. 1-Nov. 15	Juvenile	♀	106	2.34	±.02		
Nov. 16-Nov. 30	Juvenile	♀	64	2.14	±.02		<.0001
Dec. 1-Dec. 15	Juvenile	♀	50	2.26	±.04		.009

A number of other investigators have recorded similar seasonal trends in the weights of small birds.

ANNUAL WEIGHTS

Mallards in all age and sex groups, and Pintails in three such groups, averaged (Tables 7 and 8), slightly more in 1939 than in 1940. However, differences were so slight as to have no statistical significance. Again, drake and hen Pintails were heavier in 1939 than in 1938, but differences were not statistically significant (Table 9).

EFFECT OF FOOD AND WEATHER ON WEIGHTS

As indicated by data, food and weather have only a slight effect on the weights of the ducks taken in Illinois. To illustrate, compare the abundance of the principal plants Pintails use for food with the weights of that species.

These plants—millets, smartweeds, pigweeds, nutgrasses—were almost absent from the Illinois River Valley in 1938; in 1939 there were about 595 acres of the plants in five lake basins, and in 1940 there were about 1,780 acres in the same lake basins. Yet the increased food supply did not result in any significant overall increases in either Pintail or Mallard weights. However, Pintail numbers increased—comprising 1.44 per cent of the duck population in the Illinois River Valley in 1938, 2.19 per cent in 1939, and 3.35 per cent in 1940, as the food supply increased. Mallards obtain the bulk of their food from waste corn left in fields by the mechanical pickers; this supply varies little from year to year.

Available food supply is apparently a factor in Mallard weight differences in the Illinois and Mississippi River valleys, for waste corn, although occurring in almost unlimited quantities in both areas, is largely unavailable in the Mississippi River Valley because of the lack of a suitable series of rest areas there. The lack of rest areas apparently results in a more rapid migration through the Mississippi region than through the Illinois River Valley.

When cold weather and snow have greatly reduced the food supply, this has seldom reduced the weight of ducks, although severe weather probably was responsible for a statistically significant loss in weight among adult and juvenile drake Pintails and juvenile hen Mallards from December 1 to 15, 1939 (Tables 3 and 5). Mild weather and a bountiful food supply, which prevailed from November 1 to 11, 1940, probably accounted for the increased weight of Pintails during that period (Table 4).

TABLE 7

YEARLY AVERAGE WEIGHTS OF MALLARDS, BY AGE AND SEX CLASSES, IN THE
ILLINOIS RIVER VALLEY, 1939-1940

Year	Age	Sex	Number	Average weight	Standard error	Standard error of difference	Probability
1939	Adult	♂	344	2.80	±.01	.024	.04
1940	Adult	♂	287	2.75	±.02		
1939	Adult	♀	194	2.42	±.02	.028	.04
1940	Adult	♀	208	2.36	±.02		
1939	Juvenile	♂	353	2.60	±.01	.014	.16
1940	Juvenile	♂	377	2.58	±.01		
1939	Juvenile	♀	284	2.30	±.01	.014	.04
1940	Juvenile	♀	387	2.27	±.01		

TABLE 8

YEARLY AVERAGE WEIGHTS OF PINTAILS, BY AGE AND SEX CLASSES, IN THE
ILLINOIS RIVER VALLEY, 1939-1940

Year	Age	Sex	Number	Average weight	Standard error	Standard error of difference	Probability
1939	Adult	♂	71	2.32	±.03	.04	.13
1940	Adult	♂	166	2.26	±.02		
1939	Adult	♀	23	1.98	±.04	.05	.55
1940	Adult	♀	37	1.95	±.03		
1939	Juvenile	♂	119	2.20	±.03	.04	.45
1940	Juvenile	♂	284	2.17	±.02		
1939	Juvenile	♀	75	1.81	±.03	.04	.19
1940	Juvenile	♀	144	1.86	±.02		

TABLE 9

YEARLY AVERAGE WEIGHTS OF PINTAILS, BY SEX CLASSES, IN THE
ILLINOIS RIVER VALLEY, 1938-1939

Year	Sex	Number	Average weight	Standard error	Standard error of difference	Probability
1938	♂	112	2.15	±.02	.04	.32
1939	♂	202	2.19	±.03		
1938	♀	93	1.79	±.02	.04	.13
1939	♀	125	1.85	±.03		

We deduce, therefore, that, except in rare instances, the number of ducks present in an area is well within the carrying capacity of that area; a reduction in the available food supply, brought about by adverse weather or other conditions, results in a reduction in numbers roughly comparable to the reduction in food supply. Consequently, the ducks remaining have sufficient food to maintain their body weight.

We conclude that: (1) Illinois hunters in 1938 were mistaken in their belief that ducks were in poor flesh because of a scarcity of food. (Perhaps these hunters were killing unusually large numbers of juveniles which average from 4 to 9 per cent lighter than adults.) Because of mobility, ducks undergo little change in weight with adverse food and weather conditions in a limited area. (2) Canvas-backs are the heaviest of the ducks that migrate through Illinois, followed by Mallards and Black Ducks, Pintails, and Gadwalls; Green-winged Teals are the lightest. (3) Very few Mallards or Black Ducks weigh over three pounds; no ducks of these species were found to weigh four or five pounds.

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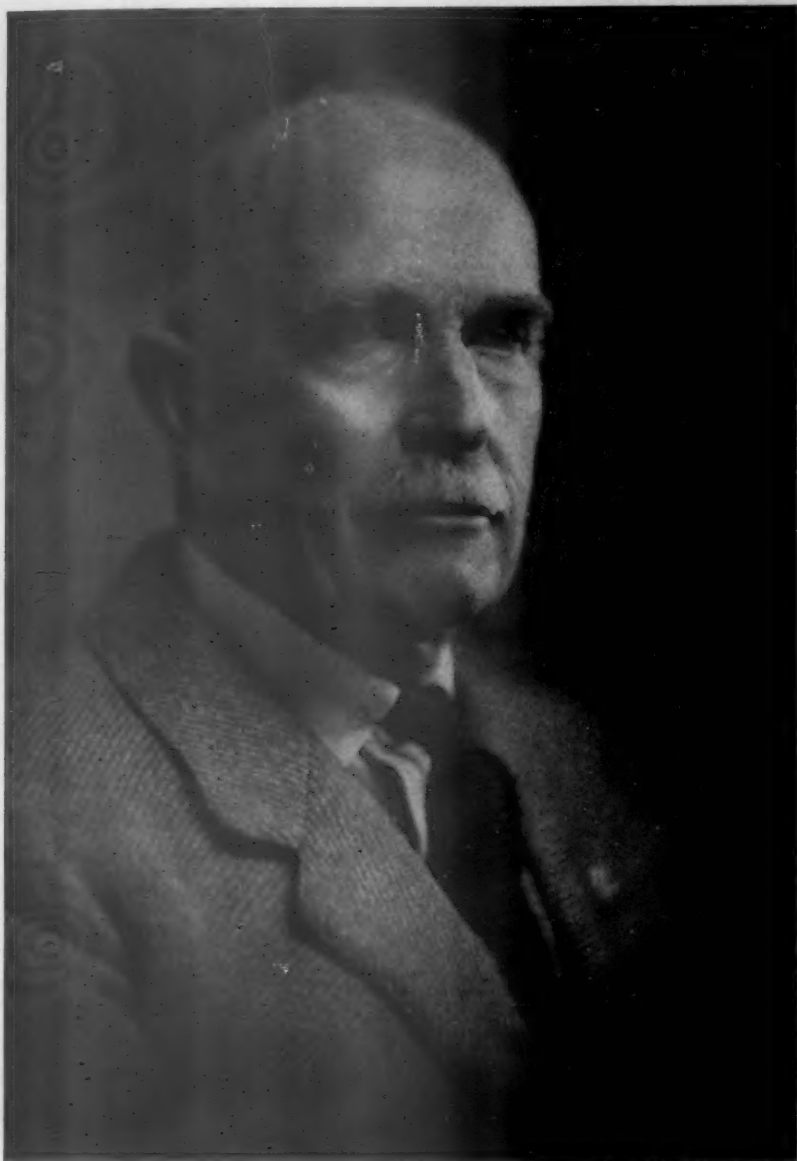
Illinois Natural History Survey
Urbana, Illinois

ALLAN BROOKS, 1869-1946

BY HAMILTON M. LAING

Plate 15

A REVIEW of the life of the late Allan Brooks reminds us anew that naturalists, like poets, are born—or made very young. Scion of a naturalist father, William Edwin Brooks, of Newcastle-on-Tyne stock, engineer by profession but ornithologist in heart, young Allan had the blood. Named after one of his father's greatest friends—Allan O. Hume—he seems to have climbed out of the cradle into an environment which in tenderest years shaped a course that through life never wavered. Destiny marked him for ornithology. In a biography covering the greater part of his life (*Condor*, Jan.-Feb., 1938) Marjorie Brooks has given us almost all the salient points about Allan's early days that probably we shall ever know, and everything points to the fact that he was born with a genius for biological study, a vast



Allan Brooks

thirst to know, and the physique and determination to make use of his talents.

For those of us who knew intimately the man of later years, it is easy to understand the enthusiasm with which as a boy not yet even in his teens, at school in England (1873-1881) where he was sent from his birthplace in India, he investigated the bird life of the Northumberland moors, listened to the conversation of such men as Henry Seebohm, or took instruction in egg-blowing and butterfly collecting from John Handcock. Or later the joy with which he applied himself to the new world of birds in the woods of Ontario (1881-1887) when his father, quitting India, moved his family there. American ornithological science was then very much younger than it is today and an entrancing field of study opened for both father and son, though doubtless it was one that did not mate well with pioneer farming. However, the father seems to have been content to let young Allan follow his natural bent and so the boy studied birds a great deal more than he did agriculture. In those six grand years, the young naturalist learned to make good skins, even of Passenger Pigeons. He learned also the pleasures of duck shooting, which he was never to forsake, and on fascinating trips to Lake Ontario with his father, met at Burlington Bay the then numerous waders, a tribe of birds that all through his life were of absorbing interest to him.

When, in 1887, W. E. Brooks moved his family from Milton, Ontario, to a new farm at Chilliwack, British Columbia, Allan, now a youth of eighteen, found another new world of natural history ready for conquest. From this time on he adopted the West. For though in 1891 the father sold the Chilliwack place to return to a new Ontario farm at Mount Forest, and Allan had to follow a year later, he left his heart in British Columbia. Three years later, in 1893, he returned. His bondage to agriculture—truly Pegasus hitched to a plow!—was ended forever. And it seems he had left behind him the only period in a long life in which he worked at anything he did not want to do.

Now followed a period that until about 1905, while it was outwardly a time of drifting, was really a stern apprenticeship to his life work. Of this time he later said jokingly that he was then most concerned over earning a dollar a day so as to get all the hunting he wanted (both birds and big game) including one big game hunt a year in some new region. He got the hunting and he kept solvent, and he held his independence and with it the right to study Nature in whatever form it appealed to him. But every expedition was more than a hunting trip; always bird study was the real mainspring, and in addition to collecting specimens, he made drawings of them—both in black and

white and watercolor. From boyhood years he had never let this natural faculty go fallow. To finance this program he resorted to collecting zoological material in the summer, particularly small mammals, and to trapping fur in the winter. The valley of the Fraser River in the vicinity of Sumas Lake was then rich in forms of small mammalian life and it is a certainty that Brooks was skillful in its capture. But at that time markets for such material were few and prices for specimens pitifully low. He searched for them everywhere. Up in the Lihumpton alpine basin, nearly 5000 feet above the Chilliwack Valley a blazed tree stands today showing a record of exploration of A. Brooks and E. Brooks (his brother) dated 1895. There were no trails up that mountain then.

His quests in this period took him from the Fraser to the Okanagan in 1897 for two years; the Cariboo, Horsefly region, 1901; Penticton, winter of 1901-1902; Comox, east side of mid-Vancouver Island, 1903; Quatsino, northwest side of Vancouver Island, 1904. Next year he moved from Sumas in the Fraser Valley to the Okanagan to make his future home there at The Landing.

From about the turn of the century, a few of Brooks's bird drawings had caught the editorial eye in such outdoors magazines as 'Recreation,' but it was about 1906, when he was given his first commission to illustrate scientific bird works, that he really showed his mettle. From this time forward there was but one pattern to his life, interrupted only by the years of the first World War. New commissions merely meant hard work to be followed when possible by new birding expeditions farther afield.

It was in the few years previous to the war that he concluded his big game hunting with several trips into his beloved mountains: the Gold Range, Selkirks and Rockies, and such places. His trophies were brought home and mounted by himself! Thus, when his one-time cabin later blossomed into a more splendid home, the walls of his spacious museum-study-workroom were hung with representatives of practically all the big game to be found in British Columbia.

From about 1910 the itinerary of his restless feet, as set down by Marjorie Brooks, shows the following:

1911. First trip to California, largely in connection with illustrations for Dawson's 'Birds of California.'

1912. Second, longer trip to California, collecting in several parts of the state.

1913. A continuation into Arizona, collecting at Tucson and in the Chiricahua Mountains.

1914-1919. War years. England and France.

1919. On return to Canada (April) collected at Comox, Vancouver Island and the Queen Charlotte Isles.

1920. Trip to Alberta, thence to his first A. O. U. meeting in Washington, D. C., followed by a winter in Florida.

1921. A continuation, collecting in Florida, Texas and California.

1922. A trip to Alberta (Sullivan Lake); later to California—the latter an extensive trip of eleven months, including exploration at Snelling, Merced County, Buena Vista Lake, Mt. Pinos, the San Bernardino Mountains and Morro Bay.

1934. Brooks-Swarth expedition to Atlin, B. C.

1925. Winter, Nanaimo, Vancouver Island.

1926. Wedding trip to Alert Bay and Comox, Vancouver Island.

1927-1928. Winter, Brownsville, Texas; Silver City, New Mexico; Tucson, Arizona.

1928. Summer, Comox, Vancouver Island. Built winter home here.

1930. Trip to New Brunswick and Nova Scotia; particular attention to Grand Manan, Bay of Fundy.

1931. Trip to New Zealand. Winter spent there.

1933. Trip to California and New Mexico, collecting along the Mexican border.

1934. Trip to Fort Simpson, B. C.; district north of Skeena River; valley of the Skeena, itself; outlying islands of near-by coast. Round-the-world trip begun via New Zealand.

1935. Continuation of world trip—Australia, Ceylon, India, Mediterranean ports, England, Washington, D. C., Ottawa, Canada. During these wanderings pelagic birds were a special study.

1936. Trip to California, working the Suisan Marshes and Tomales Bay with several sea trips collecting shearwaters and albatrosses. Later in this year a trip to the north shore of Queen Charlotte Islands.

1939. Trip to California and Arizona.

It will be noted that in the foregoing the one deviation from the pattern is that, in the spring of 1926, Brooks made a side trip into the field of matrimony. In April he married Marjorie, daughter of the late Mr. and Mrs. Richard Holmes of Arundel, England. To some of his startled, more intimate friends, it was difficult to fit him into the new picture—Leander stroking the Hellespont with a grindstone tied to his neck! But his friends were soon reassured. Marjorie proved a woman of understanding heart, accepting bird men in general and her husband in particular without attempts at impossible alterations. To Allan, marriage was but a necessary detail in the larger biological pattern. When the couple called at Comox after the short wedding trip to Alert Bay—where the groom annexed a fine series of spring-plumaged Surf Birds over which he was still gloating!—he declared that he was going to be the best husband he knew how to be. The two later shared many expeditions afield, near and far, including the New Zealand and round-the-world trips, during which latter, while they stopped at Arundel, Sussex, England, they gloried alike in the English birds of the spring song season and heard the Nightingale. The fruit of this union, their son, Allan Cecil Brooks, now in his 20th year, and in his fourth year at the University of B. C.—Biology, of

course, a third generation naturalist—bids fair to pick up and carry the banner dropped by the hand of his remarkable father.

The 1939 trip was the last one far afield. But though he was now in his seventieth year, it was the cramping restriction of World War II, rather than his age or lack of enthusiasm, that restrained him. Denied the use of his winter home at Comox because of war regulations, he wintered in 1942 at Sooke, in the southwest corner of Vancouver Island, and in 1944-1945 at Yellow Point, on the southeasterly side, his zest for the field as keen as ever. The last local field trips included an 18-day round in the Kamloops region in June, 1944—the Flammulated Screech Owl, sought for years, a special desideratum—and in May, 1945, a 17-day exploration of the Oliver district, Okanagan Valley, and also the near-by Similkameen Valley, working in both cases close to the Canada-U. S. boundary.

It was at Yellow Point, Vancouver Island, from the Lodge windows that his ever-prying binoculars discovered the almost unbelievable under-water action of the alula of the wings of White-winged and Surf Scoters—the basis of one of his last published papers (*Auk*, 62: 517-523, Oct., 1945). And it was the the basis also of his usual charming greeting card of Christmas of the same year, at which time, as it arrived in the homes of hundreds of his friends, he lay dying in Comox hospital.

Now that Brooks is of the past and we can assemble at least some of the details of his full life, the one thing that stamps him a man apart is his singleness of purpose. From his birth in India, at Etawah, to his last rational day at Comox, there seems almost nothing that does not point like a compass to one magnetic pole. No environmental handicap seems to have been able even to waver the needle of his life. Of formal schooling after the age of twelve years, he must have received little. He was self taught, a voracious reader aided by a remarkably retentive memory. Whether this last was a natural asset or a matter of cultivation, who can say? Certainly his was no tired brain, weary of collegiate cramming, that he brought to face the world in early manhood. He read, remembered, and for the rest went direct to Nature. Thus by training his head became his filing cabinet. And both from books and from Nature he read widely.

He probably was endowed naturally with the gift of memory. On seeing Brooks sit down and paint a bird accurately as to details of anatomy, attitude and color, quite without aid of a model, field sketches or notes, many folk have marvelled. "What is my head for?" he would reply. Yet he seldom painted 'out of his head'; his love of accurate detail was too strong. Usually he worked with one of his skins at hand.

But memory, however good, is likely to be fickle, especially with mounting years; and no head could file away all the details of a life spent on such broad interests as captivated young Brooks. He must have realized this, for whether from precept, example or sheer instinct, he early adopted the diary habit, recording in his journals almost daily through the years a wealth of minutiae that otherwise largely would have been lost. The following is the last note from his pen, written at Comox, in 1945.

"Dec. 12. The last two days have been fine and frosty (26°). One of the ravens that nest about a mile east of here was chasing an intruder [raven] over the house and westward. He (or she) kept up a continuous rattling cry: Craak-craak-craak-craak while in full pursuit. Each time he overtook the intruder the latter turned a double roll and uttered a single cry, Klook! as his pursuer overshot him. I have seen this act many times in the past 18 years, sometimes both the birds of the resident pair pursue but only one attacks."

Drawn into the text is a thumbnail sketch, one raven overshooting the other, which latter is turned on its back, presenting extended feet and open beak to the attacker.

It was in the field that Brooks was most truly in his element. He was never happier than when setting out with gun and collecting bag to tramp the 'commonage' above his Okanagan home, or to invade some new field afar. Equipped by Nature with the sharpest of eyes and ears and the general physique to apply them, he prowled endlessly. From tiny shrew to bighorn sheep or elk, from hummer to eagle, he knew from experience the technique of capture and preparation of the specimen. Though many hunters might outwit big game as successfully, in the field of birds he was unique, early developing a technique of his own not only in the capture of the specimen but in its make-up as study material.

At the art of calling birds he was an expert. The many field workers who today in western woods make use of the simple magic of the note of the Pygmy Owl in calling up small birds, have Brooks to thank, and he in turn owed a debt to his father who learned the trick from the natives of India. At mimicry of the Horned Owl, he was past master, and by means of it called not only *Bubo* but many hawks, endless crows and magpies and many other birds. In his unrelenting war on crows he needed no artificial call—his instrument was his larynx. The boom of the owl, the angry cry of *Corvus*, followed by the latter's terrified squall in the clutches of death—all worked their magic in a matter of seconds. The dry honk of Brant, the plaintive whistle of the Poor-will came equally true off the same reed—a very versatile instrument.

Though he came home from World War I deafened to the extent that the Skylark's ethereal song never again could reach him, nor any high-pitched bird note of his own woods, he seldom admitted the handicap but merely leaned more heavily on his vision and plied his legs the harder. Fortunately, the world of low-pitched sound was still open to him. In his earlier years he had done most of his bird hunting by ear.

In the field, with no apparent display of armament, he was proficiency personified. Heavy loads and light, and half loads as well as two auxiliaries were ready for instant use without any fumbling; and often he carried in addition a long-barreled .22 pistol with which he was expert and took many large specimens that defied shotgun range. A firm believer in the Boy Scout motto, he was always ready for anything the day might bring. Binoculars lay on his chest as though they were a part of him and sometimes he packed afield even a small, low-powered telescope. There must be no mysteries left behind him.

Though old-fashioned to high degree in certain respects, he was constantly striving for something new and better. In a few years I saw him turn from his highly efficient decoy squeak of his own lips, to a very vocal toy rubber mouse that he declared the perfect 'killer'; and in turn forsake the toy for a new love of wood and film of his own making, that he was sure—in advance—would prove the best bird call ever. He was seldom long static, never quite satisfied.

The same striving for the ideal haunted him in the matter of specimen make-up. Many times he changed his methods. Though he credited McIlwraith with inciting him to sound skin-making, the certainty is that he would soon have come to it himself. A gift skin in hand dated 1893 (Blackburnian Warbler, Mt. Forest, Ont.) shows at least clean, careful workmanship—historic, as a symbol of his bondage to agriculture! From that time forward he seems to have striven constantly to improve the quality of the cabinet skin, and also to teach others to do so. With the novice at his elbow as he plied deft fingers, he glowed in his element. Especially did he extend himself over the waterfowl, and most of his later ducks, and indeed many other birds, are really mounted specimens minus the living pose. This took time, but he seldom if ever sacrificed make-up to speed. The finished product was what counted. Even the arduous methods of degreasing fat skins were cheerfully undertaken. The greasy seam, the stained label, were badges of poor workmanship. He would have none of it. Thus it is that his combination of field technique and manual dexterity at the skinning table built up through the years an individual collection of over 9000 skins, unique not only for geographical coverage, and for completeness in its life history within a given species, but also for sheer quality.

Indeed, it is doubtful that such another collection could ever again be made by any future naturalist. In this hurrying age with its eyes on atomic energy, the task would be almost insuperable even should an individual with the Brooks genius be born. The incentive of the new and unexplored field must, in future, largely be lacking.

It will be seen that the Brooks expeditions took him across the face of the continent. Naturally he worked most thoroughly the southern part of his beloved province of British Columbia. It will be noted that the North, so often a lodestar to ornithologists, held little appeal for him. Not even ornithology could entice him into a mosquito-cursed region after his experiences in youth with the Sumas breed in the Fraser Valley. It was largely because of these pests that he made his permanent home in the dry Okanagan Valley.

Details of these numerous field trips through half a century, giving only the highlights of each, would require space far beyond the limits of this sketchy biography. However, much of them has been committed to paper already through the Brooks diaries. With his usual attention to detail he set down with almost day to day constancy the natural history that came under his eye. In reporting his home area, details included the weather, temperature, rainfall, migration data, abundance or scarcity of birds and mammals, or even the lower forms of life such as toads, frogs or grasshoppers. At the end of each game season was given a summary, with Colonel Harry Hawker exactitude, of the daily and total bag of game taken. The future was never to be left in doubt over such matters of the past.

In the cabinet, Brooks was meticulous in his care of specimens. They were not cordwood, as he once reminded a rough handler. Here also order was to him Heaven's first law; no confusion could be tolerated. He gloated over a tray where all specimens were made to a single model; uniformity was a high desideratum. They were beautiful things; his touch was almost a caress; yet he insisted on well-built specimens that could stand usage. To have to place poorly made exchange material among his own sleek treasures hurt him, and this, perhaps, had something to do with the driving urge that took him to far fields to get material first hand and bring it to the cabinet as he wanted it.

Whatever the verdict of time will be on Brooks as an authority on systematic ornithology, the present certainty is that he was often critical of those in high places and refused their judgments. That he brought to bear on his problems keen discernment and wide experience, cannot be denied. In his later years he seemed satisfied with his own verdicts almost to the point of autocracy, and one of his best

friends once remarked that what scientific bird study needed most was an ornithological Pope and he elected Allan to the Holy See! He was seldom given to hasty opinion, however, and I have seen him pore over a dozen Purple Finches for an hour without a word.

We are all more or less the products of environment in early years. It is doubtful that Brooks would have been quite Brooks in any other province of the Dominion. "Now," said a contemporary naturalist, "I know where Allan Brooks gets his backgrounds!"—gazing as he spoke across Comox Bay upon the blue Beauforts of Vancouver Island. Yet his was the painting more of knowledge than of scenic inspiration, because knowledge was the first interest of his life. He seems to have had little interest in art for its own sake. To him it was but a means to an end—to show his bird to others as he himself saw it. Thus his work was elemental. Of the newer schools of 'impressionism' and 'interpretation' of Nature, it is doubtful that he knew they existed. He called himself an 'illustrator.' His painting, early in life, of the perishable parts of his birds in order to record the true colors as in the living, doubtless was good training as a step to more ambitious picture making later; but this same attention to minute detail was never forsaken and is evident in the last stroke of his brush. He literally painted his bird feather by feather, and if the savant sometimes might call for more freedom of expression, more suggestion and imagination and less detail, the certainty is that every painting that left his hands in the fullness of his later years, bears in it a note of finality—something that will pass down the generations as a thing of beauty, well done.

There is every indication that, as an artist, though he possessed finest qualifications, he worked a trifle handicapped by the demands of science. He voluntarily clipped the wings of his imagination that he might worship more sincerely at the shrine of Things As They Are.

This last is borne out by the very medium in which he did most of his best work. Early in life he seems to have followed the conventional black and white and transparent water color. Clippings in my file, reproductions of waterfowl drawings printed in *Recreation Magazine* about 1901, show proficient handling of black and white. A gift painting of the years of World War I (1917) given to me some years later, is done in transparent water color. By this time, as an illustrator of scientific bird books, he had gained recognition; but he had now changed method and used tempera. In October and December of 1925, when he paid two short visits to Comox, making skins and painting in my home, he seemed to have forsaken transparent color entirely and more than once went to some length to explain the advantages of the opaque for reproduction. This last method he main-

tained through the remainder of his life. He worked little in oils and not so happily; the medium was little suited to the fine details he insisted on portraying. But characteristically, he had not picked the easy way. Opaque is difficult of manipulation; yet he shows in the softness and tenderness of many background scenes a mastery that is high genius.

And those backgrounds fit. His Kootenay elk is in the shrubbery of that region; his Harris's Hawk poses against a southern scene; his Sooty Grouse is backed by details that would fit nowhere else in America. For he carried in his head a wealth of such detail. Though no botanist, he was interested in every tree and plant by his trail, as he was in every creeping thing of the ground and the finny denizens of the waters. Before the artist he was the naturalist. To see a thing and not know what it was worried him; here was something new to be solved.

An inward urge drove him relentlessly. Thus when the products of his brush became comfortably lucrative, this was not allowed to crowd him an inch from the path his feet had always trod. He only toiled harder up a steeper trail. Bigger contracts meant only longer birding trips farther afield—new worlds to conquer.

In his attitude toward his contemporaries in his own particular field, he was apt to be sharply critical—warm in praise or loud in condemnation. His eye searched out details as the eye of hawk seeks prey. Any slipshod work incensed him—wrongly colored eye in the bird, or the eye badly placed; bad attitude divulging lack of anatomical study, or study in the field—away with it! As for art not connected with biology, the only opinion I ever heard him express was warm praise for Fripp's landscapes of the western mountains. He wished he could have them all.

On his more human side he was tolerant and painstakingly helpful and generous to any young biologist showing earnestness. He was impatient of the half-hearted, the fudger, the sham. He loved a man of enthusiasm and forgot his shortcomings. Once he was heard to chide an old friend: "P—, you'll die a miserable old man! You have no hobbies!" His pet aversions other than those folk who would restrain collectors afield, were: the 'balance of Nature,' which he was sure did not exist in fact, and wild life sanctuaries left with native predators uncontrolled. Despite the fact that he disliked the publicity of the platform, he was bold to address a game association meeting, at any place or time, on the subject of game matters. And he put his preaching into practice—with conviction bordering on fanaticism. Crows and magpies and bird-killing hawks beware! He was proud of

the little bird sanctuary about his Okanagan home—between 1905 and 1914, forty species had been listed as nesting successfully in the tiny area that he so rigidly policed. He called himself 'gamekeeper' to Ring-necks, European Partridges and native grouse over a good extent of his neighborhood.

Despite the urge of science, Brooks never forgot the humanities and ever remained very human. A wide reading of nonscientific matter kept his mind elastic. Possessed of a fine sense of humor, he rarely if ever laughed loudly, but could chuckle gleefully and always relished a joke. His humor was of the dry, Scotch type. In politics a Conservative—naturally; in religion, nonsectarian. He did not attend a church; never once did I hear him discuss religion, and probably he paid his highest homage and reverence to Nature, the wonderful world about him—a world in which, he declared in one of his last letters, he saw more beauty as life declined. If the usual games of youth seem to have been pushed aside in favor of bird-nesting, the competitive spirit in him nevertheless was very strong. For he relished card games and was a keen and skillful bridge player. In the realm of music he pronounced himself a dub, but in reality he had a discerning appreciation of good music; and if he never hummed a tune, yet his remarkable skill in bird mimicry, both by whistling and by vocal note, proved that he possessed an excellent musical ear and memory. He did not play a musical instrument probably for the same reason he did not smoke: it was a waste of time; he had tried it.

By most standards Brooks was very temperate in his habits. He had been heard to say that he believed his stomach was no larger than his fist—a shrinkage from the normal, I judge, attributable to his long bachelorhood through years when he was too busy on the quest of birds and mammals, large and small, to waste time over such a detail as food. If he relished the warmth of good liquor, especially to thaw out the pipes of conversation at meetings of bird men, he at least knew how to use it and when. His son recounts that one day in recent years, when fire threatened the Brooks premises, especially the precious museum, his father looked the situation over calmly, turned away to his cabinet, poured himself a stiff bracer, then turned to fire-fighting with his usual enthusiasm and determination. This was Brooks's second fire, for in 1921 he had a disastrous visitation that played havoc with specimens, books, guns and equipment, in attempted rescue of which he badly burned his hands.

Among his intimates, the Brooksonian dry humor is history. Of a woman who saw, *a priori*, in her birds what wasn't there, he exclaimed: "That woman has chromatic aberration!" Chiding me once for not

working more enthusiastically the Comox Spit, he remarked that I would not recognize the place he got the Horned Lark anyhow, as the fir tree there had grown since my last visit. When once I remarked on McIlwraith's splendid facial pubescence, in a photograph depicting the ornithological pioneers of the '90s in Ontario, Brooks remarked drily: "And many a time I have seen him shoving grub into that with a knife." On dismounting from my motorbike carrier after some rough miles: "There was an English queen said she had 'Calais' engraved on her heart. I think I have 'Harley-Davidson' stamped on another part of me!" He was wont to explain, with a chuckle, the prominence of his serviceable ears, by the fact that as there were no cows in India, they fed him during infancy on asses' milk.

He was old-fashioned by instinct, yet to save time to the goal he sacrificed some of these deep-rooted leanings. When he cheerfully mounted the rump of the motorbike, it was not to save his legs—for he prowled afoot with the persistence of a coyote—but to keep up his end at that rendezvous with Duck Hawks. For the same reason he adopted the outboard motor. His radio gave him war news, not grand opera. He never used a typewriter, though his correspondence became voluminous, nor owned or drove an automobile; he rode in them for but one reason. He detested the telephone in his home. Despite the splendid game heads on his study walls, he never owned a modern high-powered rifle. His .22 caliber, a favorite collecting weapon, was of early type; and even in his last years of impaired vision, he would not resort to a scope mount. To the end of his field career, in order to get the precise load he desired, he was still reloading brass shotgun shells—the only man in my generation I have seen do so. His shotguns (for game) were high-grade, hand-made English twelves, though for collecting afield through the last twenty-odd years, he wore out an American twenty-gauge. As for the modern pumpguns and autoloaders, I doubt that he would have been seen in the same field with a user of such. In field dress he never appeared in the standard togs of the hunter or out-of-doors man, but favored British tweeds, knickers, cap, and wore them across the slopes of the 'commonage' after Ring-necks or partridge, or in quest of specimens, with the stiff-backed, plodding gait of the Old Country gentleman.

Just why Brooks gave up big game hunting so early, I was never able to learn. As for the quest of upland game and waterfowl, he loved it second only to ornithology. "How can you give up duck-shooting," he wrote, "when you were so fond of it?" and he carried on with the double barrel through the hunting season just prior to his death. Enthusiasm for a canoe trip to the North Arm of his beloved

Okanagan Lake, or to Swan Lake—a spot even more favored for ducks—never forsook him, and to the last, each year he insisted that he shot on the wing as well as he ever did. He loved to hunt and played according to the rules, and his code of field ethics was rigid.

Nor was this an affectation of later years. The following anecdote contributed by R. M. Stewart, one of Brooks's early hunting 'tilliums,' is enlightening. About 1901 the two arranged a deer hunt at Okanagan Lake, and after leaving their boat, climbed up to the benches in quest of mule deer. On the very first bench they came upon a big buck and two smaller deer. Before Stewart could do more than raise his rifle, his comrade sprang into the air, waving his arms and shouting like mad to send the animals bounding over the ridge. Brooks explained that he had come out for a hunt, not just to *kill* a deer. He would start now. Three or four hours later he came staggering back to the boat with all he could carry of the big buck.

To Brooks, the hunter of game big and small, the fisherman—for he was a devotee of the fly rod, too—the taxidermist, field and cabinet naturalist and artist, we must add Brooks the soldier. The breaking of World War I must have presented to him rather a gloomy outlook. Recognized now for what he was—about eight years previously he had illustrated Dawson and Bowles's 'Birds of Washington'—having already tasted the delights of field work in California and Arizona, he suddenly found Kaiser Wilhelm's lines across his path to ornithology. On the outbreak of war he was in England, shooting at the Bisley matches. He at once returned to Canada, where already he was enrolled in the militia with an officer's commission, to train with the First Contingent at Quebec.

Brooks the soldier seems a bit incongruous until we realize the many-sidedness of the man. He was an expert rifle shot. Already he had hunted—usually alone—most of British Columbia's big game. He was primed with an intense patriotism—British to the core, though he always denied that he was a Canadian! So the Hun was removed from his path with an efficiency that won him three mentions in dispatches, the DSO and the rank on discharge of Lieut.-Colonel. More than once Brooks was heard to express the conviction that he was born lucky. But be the 'luck' as it may, he at least returned from the conflict with no more serious handicap than a slight deafness.

The mentions in dispatches date as follows:

Capt. Allan Brooks, Nov. 30th, 1915. French.

Major Allan Brooks, Nov. 13th, 1916. Haig.

Major Allan Brooks, Mar. 16th, 1919. Haig.

All are signed by Winston S. Churchill.

The Citation: Deed of Action. Dated Feb. 1st, 1919. Major A. Brooks
7th Canadian Infantry Battalion
Distinguished Service Order.

For conspicuous gallantry in the operations of 2nd and 3rd September in front of Arras. As brigade observing officer he showed great daring and initiative, pushing forward at all times with the most advanced troops under the heaviest fire. Taking a wire with him, he kept brigade headquarters well informed of the situation, and enabled the commander to make decisions that saved many lives. When the enemy were retiring he pushed forward over 500 yards in front of the infantry and telephoned back information from a long distance in front of our advance. During the two days he personally killed twenty of the enemy by sniping shots.

During his war years there is evidence that his mind was not always occupied in soldiering. His most pleasant occupation, most suited to his genius, doubtless was as chief instructor in sniping and scouting with the Imperial Forces. His diaries, indeed, hold little mention of the war in which he took such an active part. But he met again the continental birds of his youth; he made interesting ornithological contacts in England, even managed a small collection of specimens and did some painting—the latter mostly for the Red Cross.

During World War II, the Red Cross again received generous contributions from his brush. By his years now denied any active part in the struggle, he followed the daily course of events with an intensity that must seriously have impaired his capacity for his usual work. That he lived to see the culmination of the conflict gave him vast satisfaction.

Throughout this long and active life, the human contacts of Brooks were very wide, though he was of course bound with special ties to all those interested in natural history or the hunting field. In his scientific affiliations he was a member of the A. O. U. from 1901 and later a Fellow. From about 1908 he was a Member of the B. O. U. and later an Empire Member of which there are less than a dozen. Also he was a Life Member of the Cooper Ornithological Club and member of the Pacific Bird and Mammal Society, and from about 1920 he was linked to the hunting fraternity through membership in the Boone and Crockett Club.

Allan Brooks died as he had lived—in the midst of the work he loved. A few days before Christmas, 1945, when I visited him in his study at Comox, he was busily plying his brush—a commission of three paintings for the State College of Washington. A dozen fresh skins of waders and waterfowl were at hand on the drying tray. He was ill but made light of it. Next day he finished his last painting, signed it and went to hospital. When I called to see him the evening of Dec. 23, he looked well, talked strongly with the old authority—

natural history, every breath of it, though he took time out to 'chortle' over some of the juvenile 'howlers' in the book his son had brought him—special mention going to those with a biological flavor, such as: "Solomon with his wives and porcupines." Next evening, Christmas Eve, he underwent an operation. Nothing could be done for him. He sank rapidly but lived to see the New Year, passing away on January 3. Cremation followed his simple funeral. Later, on the range rising above the lake across the water from his Okanagan home—a view he never tired of watching, and a spot his feet so often had trod—loving hands scattered his ashes.

In conclusion of this short sketch, I wish to express thanks to many friends of Brooks, who on hearing of his passing, sent in to his biographer many little revealing touches of the man, the artist, the naturalist. Due to limitations of space, much of this had to be omitted or merely suggested. My grateful acknowledgments are due also to Marjorie Brooks who previously had collected and recorded life history details that otherwise might well have been lost; and also to Allan Cecil Brooks for working up the extensive bibliography of his father's published papers.

Comox

British Columbia

TWENTY-SECOND SUPPLEMENT TO THE
AMERICAN ORNITHOLOGISTS' UNION CHECK-LIST
OF NORTH AMERICAN BIRDS¹

IN connection with work on the manuscript for the fifth edition of the A. O. U. Check-List, the Committee on Classification and Nomenclature has continued its study of proposals involving addition or elimination of forms, and other changes. The present supplement, covering cases to the end of 1946 so far as these have come to attention and have been decided, has been prepared in accordance with instruction from the Council of the Union at the meeting held in Urbana, Ill., in September, 1946.

In connection with several changes in generic names that are listed, it may be explained that the International Rules of Zoological Nomenclature, prepared by the International Commission on Zoological Nomenclature, since their adoption in 1901 have come into use by systematic workers in practically all branches of zoology and paleontology. The International Code is used extensively in ornithology in writings dealing with the birds of the world outside North America and is the basis for scientific names in a majority of the current important lists and publications dealing with the world-wide field. The A. O. U. Code of Nomenclature was the foundation for the preparation of the International Rules, the principal difference between the two having been in what has been called the "One-letter Rule." The A. O. U. Code has stipulated hitherto that generic names are to be considered identical whether the ending is masculine, feminine, or neuter, or in Greek or Latin form. The International Code, on the other hand, while it states that it is well to avoid the introduction of new generic names which differ from those already in use only in termination, or in a slight variation in spelling, holds that when once properly published such names are not to be rejected on this account. These usages in the two codes have led to differences in treatment that are confusing to all except specialists. For example, Ruddy Ducks have been recorded in the A. O. U. Check-List in the genus *Erismatura*, while in papers dealing with the West Indies they have been placed in the genus *Oxyura*. Cactus Wrens within the A. O. U. limits have been called *Heleodytes*, while in México they may be listed as *Campylorhynchus*. Other examples could be given.

The A. O. U. Committee has given much attention to these matters and has decided that it is desirable, for the sake of uniformity, to adopt

¹ The Twenty-first Supplement was published in *The Auk*, vol. 63, no. 3, July, 1946, pp. 428-432.

the changes that are required to conform with the general treatment elsewhere. It may be pointed out that nearly one million forms are currently recognized by scientific name in systematic zoology and paleontology, and the accepted treatment has been overwhelmingly in favor of the usage of the International Code. This decision results now in changes in twelve generic names in our list which are duly enumerated in the present supplement. These changes bring our usage of these names in line with the rules of nomenclature followed in other branches of science.

Committee

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6. *Diomedea melanophris* Temminck. BLACK-BROWED ALBATROSS. [82.2]
Diomedea melanophris Temminck, Nouv. Rec. Planch. Col. Ois., vol. 5, livr. 77, April, 1828, pl. 456. (Cape of Good Hope.) Additional species. Southern oceans below the Tropic of Capricorn. Accidental at Lille Hellefiskebanke, off Sukkertoppen, Greenland. See Hørring and Salomonsen, Medd. om Grønland, vol. 131, no. 5, 1941, pp. 59-60, fig. 5.
11. *Bulweria bulwerii* (Jardine and Selby). BULWER'S PETREL. Transferred to hypothetical list, as the only record. one for Greenland (Schlegel, Mus. Pays-Bas, vol. 6, livr. 4, no. 22, Procellariae, 1863, p. 9), proves on investigation to be uncertain.
21. *Morus* Leach, 1816 (after August), becomes *Morus* Vieillot, April, 1816, as the latter is not preoccupied by *Morum* Bolten 1798.
Morus Vieillot, Analyse, April, 1816, p. 63. Type, by monotypy, *Pelecanus bassanus* Linnaeus. The included species becomes *Morus bassanus* (Linnaeus).
34. *Platalea leucorodia leucorodia* Linnaeus. EUROPEAN SPOONBILL. [183.1].
Platalea Leucorodia Linnaeus, Syst. Nat., ed. 10, vol. 1, 1758, p. 139. (Europa = Sweden.) Additional species. Southern Europe, in migration to northern Africa. Accidental at Itivdleg, Julianehaab District, Greenland. See Hørring and Salomonsen, Medd. om Grønland, vol. 131, no. 5, 1941, pp. 57-58, fig. 4.
37. *Branta canadensis moffitti* Aldrich. GREAT BASIN CANADA GOOSE. [172f.]
Branta canadensis moffitti Aldrich, Wilson Bull., vol. 58, no. 2, June (August 2), 1946, p. 96. (Blue Lake, near Coulee City, Washington.) Additional subspecies. Eastern Washington and northeastern North Dakota to north-eastern California and central Nebraska.
59. *Erismatura* Bonaparte, 1832, becomes *Oxyura* Bonaparte, 1828, as the latter is not preoccupied by *Oxyurus* of earlier authors.

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- Oxyura* Bonaparte, Ann. Lyc. Nat. Hist. New York, vol. 2, 1828, p. 390.
Type, by monotypy, *Anas rubidus* Wilson. The included forms will stand as follows:
Oxyura jamaicensis rubida (Wilson).
Oxyura dominica (Linnaeus).
81. *Bonasa umbellus monticola* Todd. APPALACHIAN RUFFED GROUSE. [300h.]
Bonasa umbellus monticola Todd, Auk, vol. 57, no. 3, July, 1940, p. 392.
(4000 feet elevation, two and one half miles east of Cheat Bridge, West Virginia.) Additional subspecies. Appalachian Mountains from Pennsylvania to Georgia.
81. *Bonasa umbellus phaea* Aldrich and Friedmann. IDAHO RUFFED GROUSE. [300i.]
Bonasa umbellus phaeos Aldrich and Friedmann, Condor, vol. 45, no. 3, May 24, 1943, p. 98. (Priest River, Idaho.) Additional subspecies. Eastern Washington and northeastern Oregon to northern Idaho.
86. *Pedioecetes phasianellus jamesi* Lincoln. PLAINS SHARP-TAILED GROUSE. [308e.]
Pedioecetes phasianellus jamesi Lincoln, Proc. Biol. Soc. Washington, vol. 30, May 23, 1917, p. 84. (Three miles west of Castle Rock, Colorado.) Additional subspecies. Alberta and Manitoba to eastern Colorado and Nebraska. See Friedmann, U. S. Nat. Mus. Bull. 50, part 10, 1946, pp. 196-197.
88. *Colinus virginianus taylori* Lincoln. PLAINS BOB-WHITE. [289d.] *Colinus virginianus taylori*, Lincoln, Proc. Biol. Soc. Washington, vol. 28, May 27, 1915, p. 83. (Laird, Yuma County, Colorado.) Additional subspecies. Eastern Wyoming and South Dakota to eastern New Mexico and Kansas. See Aldrich, Auk, vol. 63, no. 4, October, 1946, pp. 503-504.
88. *Colinus virginianus insulanus* Howe, dropped as not separable from *Colinus virginianus floridanus*. See Aldrich, Auk, vol. 63, no. 4, October, 1946, p. 500.
90. *Lophortyx californica plumbea* Grinnell. SAN QUINTÍN CALIFORNIA QUAIL. [294f.]
Lophortyx californica plumbea Grinnell, Condor, vol. 28, no. 3, May 15, 1926, p. 128. (San José, 45 miles northeast of San Quintín, Baja California.) Additional subspecies. Northwestern Baja California to n. lat. 30°. Introduced into southern California. See Friedmann, U. S. Nat. Mus. Bull. 50, pt. 10, 1946, pp. 287-288; Grinnell and Miller, Pac. Coast Av. no. 27, 1944, p. 562.
90. *Lophortyx californica decolorata* van Rossem. GRINNELL'S CALIFORNIA QUAIL. [294g.]
Lophortyx californica decolorata van Rossem, Condor, vol. 48, no. 6, November 29, 1946, p. 265. (Bahía Concepción, Gulf coast of Baja California.) Additional subspecies. Baja California from about n. lat. 25° to n. lat. 30°.
90. *Lophortyx gambelii ignoscens* Friedmann. TEXAS GAMBEL'S QUAIL. [295b.]
Lophortyx gambelii ignoscens Friedmann, Journ. Washington Acad. Sci., vol. 33, no. 12, December 15, 1943, p. 371. (San Elizario, Texas.) Additional subspecies. Southern New Mexico to western Texas.
91. *Oreortyx picta russelli* A. H. Miller. PALLID MOUNTAIN QUAIL. [292d.]
Oreortyx picta russelli A. H. Miller, Condor, vol. 48, no. 2, April 2, 1946, p. 75. (4300 feet elevation, 2 miles southwest of Pinyon Wells, Little San Bernardino Mountains, Riverside County, California.) Additional subspecies. Little San Bernardino Mountains, Eagle Mountain and mountains near Twentynine Palms, California.

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110. *Capella gallinago faeroensis* (Brehm). FAEROE COMMON SNIFE. [229a.] *Telmatias Faeroensis* Brehm, Handb. Naturg. Vög. Deutschlands, 1831, p. 617. [Faeroes.] Additional subspecies. Iceland and the Faeroes. Casual at Angmagssalik, east coast of Greenland. See Helms, Medd. om Grønland, vol. 58, no. 4, 1926, p. 248; Hørring and Salomonsen, idem, vol. 131, no. 5, 1941, pp. 42-43.
121. *Erolia alpina schinzii* (Brehm). SOUTHERN DUNLIN. [243c.] *Pelidna Schinzii* Brehm, Beitr. Vogelk., vol. 3, 1822, p. 355. (Baltic Coasts.) Additional subspecies. Iceland to Norway, northern Germany, and the British Isles; breeding in the Angmagssalik District, Greenland. See Hørring and Salomonsen, Medd. om Grønland, Bd. 131, no. 5, 1941, pp. 38-39.
133. *Larus canus canus* Linnaeus. EUROPEAN COMMON GULL. [55a.] *Larus canus* Linnaeus, Syst. Nat., ed. 10, 1758, vol. 1, p. 136. (Europa = Sweden.) Additional subspecies. Western Europe. Casual at Fiskenaes and near Godthaab, Greenland. See Hørring and Salomonsen, Medd. om Grønland, vol. 131, no. 5, 1941, pp. 46-47.
134. *Larus ridibundus sibiricus* Buturlin. SIBERIAN BLACK-HEADED GULL. [55.1a.] *Larus ridibundus sibiricus* Buturlin, Mess. Orn., vol. 2, no. 1, 1911, p. 66. (Kamchatka.) Additional subspecies. Eastern Siberia. Recorded from Kiska Harbor, Kiska Island, Aleutian Islands. See O. J. Murie, Auk, vol. 62, no. 2, April, 1945, p. 313.
146. *Cepphus grylle grylle* of Check-List becomes *Cepphus grylle atlantis* Salomonsen, Kungl. Vetenskaps-och Vitterhets-Samhälles Handl. Sjätte Följden, ser. B, Bd. 3, no. 5, 1944, p. 77. (Göteborgs Skärgård, Bohuslän, Sweden.) (Typical *C. g. grylle* is restricted to the Baltic Sea.)
168. *Micropallas* Coues, 1889, becomes *Micrathene* Coues, 1866, as the latter is not preoccupied by *Micrathene* Sundevall, 1833, for a genus of Arachnida.
Micrathene Coues, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 51. Type, by orig. design., *Athene whitneyi* Cooper. The included forms will stand as follows:
Micrathene whitneyi whitneyi (Cooper).
Micrathene whitneyi idonea (Ridgway).
Micrathene whitneyi sanfordi (Ridgway).
171. *Cryptoglaux* Richmond, 1901, becomes *Aegolius* Kaup, 1829, as the latter is not preoccupied by *Aegolia* Billberg, 1828, for a genus of insects.
Aegolius Kaup, Skizz. Entw.-Gesch. Eur. Thierw., 1829, p. 34. Type, by monotypy, *Strix tengmalmi* Gmelin = *Strix funereus* Linnaeus. The included forms will stand as follows:
Aegolius funereus richardsoni (Bonaparte).
Aegolius funereus magnus (Buturlin).
Aegolius acadicus acadicus (Gmelin).
Aegolius acadicus brooksi (Fleming).
184. *Trogon ambiguus ambiguus* Gould, COPPERY-TAILED TROGON, as listed in the Fourth Edition of the Check-List, is now recognized to include two subspecies as follows:
Trogon elegans ambiguus Gould. NORTHEASTERN COPPERY-TAILED TROGON. [389.] *Trogon ambiguus* Gould, Proc. Zool. Soc. London, vol. 3, no. 27, June 1, 1835, p. 30. (Northern México.) Lower Rio Grande valley, Texas, to southern México.

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- Trogon elegans canescens* van Rossem. NORTHWESTERN COPPERY-TAILED TROGON. [389a.] *Trogon elegans canescens* van Rossem, Bull. Mus. Comp. Zool., vol. 77, December, 1934, p. 441 (San Javier, Sonora.) Southern Arizona to northern Sinaloa. See Nineteenth Supplement, Auk, vol. 61, 1944, p. 451.
189. *Ceophloeus* Cabanis, 1862, becomes *Hylatomus* Baird, 1858, as the latter is not preoccupied by *Hylotoma* Latreille, 1802, for a genus of insects.
Hylatomus Baird, Rep. Pacific R. R. Surv., vol. 9, 1858, p. 107. Type, by orig. design., *Picus pileatus* Linnaeus. The forms will stand as follows:
Hylatomus pileatus abieticola (Bangs).
Hylatomus pileatus pileatus (Linnaeus).
Hylatomus pileatus floridanus (Ridgway).
Hylatomus pileatus picinus (Bangs).
- 194-199. *Dryobates* Boie, 1826, becomes *Dendrocopos* Koch, July, 1816, since the latter is not preoccupied by *Dendrocopus* Vieillot, April, 1816, for a genus of Dendrocolaptidae (*Dendrocopus* Vieillot being placed now as a synonym of *Dendrocolaptes* Hermann, 1804).
Dendrocopos Koch, Syst. baier Zool., vol. 1, July, 1816, p. 72. Type, by subs. design., *Picus major* Linnaeus. The forms will stand as follows:
Dendrocopos villosus septentrionalis (Nuttall).
Dendrocopos villosus terraenovae (Batchelder).
Dendrocopos villosus villosus (Linnaeus).
Dendrocopos villosus audubonii (Swainson).
Dendrocopos villosus silkensis (Swarth).
Dendrocopos villosus picoideus (Osgood).
Dendrocopos villosus harrisi (Audubon).
Dendrocopos villosus hyloscopus (Cabanis and Heine).
Dendrocopos villosus scrippsae (Huey).
Dendrocopos villosus orius (Oberholser).
Dendrocopos villosus monticola (Anthony).
Dendrocopos villosus leucothorectis (Oberholser).
Dendrocopos villosus icastus (Oberholser).
Dendrocopos pubescens medianus (Swainson).
Dendrocopos pubescens pubescens (Linnaeus).
Dendrocopos pubescens nelsoni (Oberholser).
Dendrocopos pubescens leucurus (Hartlaub).
Dendrocopos pubescens gairdnerii (Audubon).
Dendrocopos pubescens turati (Malherbe).
Dendrocopos scalaris symplectus (Oberholser).
Dendrocopos scalaris cactophilus (Oberholser).
Dendrocopos scalaris eremicus (Oberholser).
Dendrocopos scalaris lucasanus (Xantus).
Dendrocopos nuttallii (Gambel).
Dendrocopos arizonae arizonae (Hargitt).
Dendrocopos borealis borealis (Vieillot).
Dendrocopos borealis hylonomus (Wetmore).
Dendrocopos albolarvatus albolarvatus (Cassin).
Dendrocopos albolarvatus gravirostris (Grinnell).
210. *Myiochanes* Cabanis and Heine, 1860, becomes *Contopus*, Cabanis, 1855, as the latter is not preoccupied by *Contipus* Marseul, 1853, for a genus of insects.

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- Contopus* Cabanis, Journ. für Orn., vol. 3, no. 18, November, 1855, p. 479. Type, by orig. design., *Muscicapa virens* Linnaeus. The included forms will stand as follows:
- Contopus pertinax pallidiventris* Chapman.
Contopus virens (Linnaeus).
Contopus richardsonii richardsonii (Swainson).
Contopus richardsonii peninsulae Brewster.
- 212-215. *Otocoris* Bonaparte, 1838, becomes *Eremophila* Brehm, 1828, as the latter is not preoccupied by *Eremophilus* Humboldt, 1811, for a genus of fishes. *Eremophila* Brehm, Isis, vol. 21, pts. 3 and 4, 1828, p. 322. Type, by subs. design., *Alauda alpestris* Linnaeus. The forms will stand as follows:
- Eremophila alpestris arcticola* (Oberholser).
Eremophila alpestris hoyti (Bishop).
Eremophila alpesiris enthymia (Oberholser).
Eremophila alpestris alpestris (Linnaeus).
Eremophila alpestris leucolaema Coues.
Eremophila alpestris praticola (Henshaw).
Eremophila alpestris giraudi (Henshaw).
Eremophila alpestris utahensis (Behle).
Eremophila alpestris strigata (Henshaw).
Eremophila alpestris alpina (Jewett).
Eremophila alpestris merrilli (Dwight).
Eremophila alpestris lamprochroma (Oberholser).
Eremophila alpestris sierrae (Oberholser).
Eremophila alpestris insularis (Townsend).
Eremophila alpestris actia (Oberholser).
Eremophila alpestris enertera (Oberholser).
Eremophila alpestris rubea (Henshaw).
Eremophila alpestris occidentalis (McCall).
Eremophila alpestris adusta (Dwight).
Eremophila alpestris ammophila (Oberholser).
Eremophila alpestris leucansiptila (Oberholser).
224. *Aphelocoma sordida arizonae* and *A. s. couchii* become *Aphelocoma ultramarina arizonae* and *Aphelocoma ultramarina couchii*. See van Rossem, Auk, vol. 59, no. 4, October, 1942, pp. 572-573; Nineteenth Supplement, Auk, vol. 61, no. 3, July, 1944, p. 453.
228. *Cyanocephalus* Bonaparte, 1842, becomes *Gymnorhinus* Wied, 1841, as the latter is not preoccupied by *Gymnorhina* Gray, 1840, for a genus of Australian birds.
- Gymnorhinus* Wied, Reis. Nord-Am., vol. 2, 1841, p. 21. Type, by monotypy, *Gymnorhinus cyanocephalus* Wied. The species will stand as follows:
- Gymnorhinus cyanocephalus* Wied.
234. *Parus inornatus mohavensis* A. H. Miller. MOJAVE PLAIN TITMOUSE. [733i.] *Parus inornatus mohavensis* A. H. Miller, Condor, vol. 48, no. 2, April 2, 1946, p. 76. (4000 feet elevation at Pinyon Wells, Little San Bernardino Mountains, Riverside County, California.) Additional subspecies. Little San Bernardino Mountains, California.
236. *Psaltriparus minimus sociabilis* A. H. Miller. LITTLE SAN BERNARDINO BUSH-TIT. [743e.] *Psaltriparus minimus sociabilis* A. H. Miller, Condor,

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- vol. 48, no. 2, April 2, 1946, p. 78. (4000 feet elevation at Pinyon Wells, Little San Bernardino Mountains, Riverside County, California.) Additional subspecies. Little San Bernardino and Eagle Mountains, California.
247. *Heleodytes* Cabanis, 1851, becomes *Campylorhynchus* Spix, 1824, since the latter is not preoccupied by *Campylirhynchus* Megerle, 1821, for a genus of insects.
- Campylorhynchus* Spix, Av. Bras., vol. 1, 1824, p. 77. Type, by subs. design., *Turdus variegatus* Gmelin. The included forms are as follows:
- Campylorhynchus brunneicapillus couesi* Sharpe.
- Campylorhynchus brunneicapillus bryanti* (Anthony).
- Campylorhynchus brunneicapillus purus* (van Rossem).
- Campylorhynchus brunneicapillus affinis* Xantus.
254. *Toxostoma dorsale coloradense* van Rossem. PALLID CRISSAL THRASHER. [712b.] *Toxostoma dorsale coloradense* van Rossem, Condor, vol. 48, no. 2, April 2, 1946, p. 80. (Altitude minus 113 feet, at Brawley, Imperial County, California.) Additional subspecies. The Salton Sea region and the lower Colorado valley north to the vicinity of Needles.
- 280, 284. *Compsothlypis* Cabanis, 1851, becomes *Parula* Bonaparte, 1838, as the latter is not preoccupied by *Parulus* Spix, 1824, for a genus of Furnariidae (*Parulus* now being placed as a synonym of *Synallaxis*).
- Parula* Bonaparte, Geogr. Comp. List Birds Eur. and North Amer., 1838, 1838, p. 20. Type, by monotypy, *Parus americanus* Linnaeus. The classification and forms affected will stand as follows:
- FAMILY PARULIDAE (for FAMILY COMPSOTHTYPIDAE).
- Parula americana pusilla* (Wilson).
- Parula americana americana* (Linnaeus).
- Parula pitiayumi nigrilora* Coues.
- Parula graysoni* (Ridgway).
321. *Carpodacus mexicanus solitudinis* Moore, of the Nineteenth Supplement, Auk, vol. 61, no. 3, July, 1944, pp. 460-461, is found on further investigation not to be definitely separable and is therefore dropped. See Grinnell and Miller, Pac. Coast Av., no. 27, December 30, 1944, p. 454.
329. *Oberholseria* Richmond, 1915, becomes *Chlorura* Sclater, 1862, since the latter is not preoccupied by *Chlorurus* Swainson, 1839, for a genus of fishes.
- Chlorura* P. L. Sclater, Cat. Coll. Amer. Birds, 1862, p. 117. Type, by monotypy, *Fringilla chlorura* Audubon. The species will stand as follows:
- Chlorura chlorura* (Audubon).
333. *Pipilo fuscus relictus* van Rossem. HARQUAHALA BROWN TOWHEE. [591h.] *Pipilo fuscus relictus* van Rossem, Auk, vol. 63, no. 4, October, 1946, p. 561. (Altitude 3500 feet, north slope of Harquahala Mountains, Yuma County, Arizona.) Additional subspecies. Harquahala Mountains, Arizona, above 2500 feet.
333. *Pipilo aberti dumeticolus* van Rossem. WESTERN ABERT'S TOWHEE. [592a.] *Pipilo aberti dumeticolus* van Rossem, Condor, vol. 48, no. 2, April 2, 1946, p. 81. (Altitude minus 3 feet, 3 miles northwest of Calexico, Imperial County, California.) Additional subspecies. Lower Colorado River Valley north to the Virgin River Valley in Nevada and Utah.
342. *Aimophila ruficeps rupicola* van Rossem. HARQUAHALA RUFOUS-CROWNED SPARROW. [580g.] *Aimophila ruficeps rupicola* van Rossem, Auk, vol. 63,

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- no. 4, October, 1946, p. 562. (4000 feet altitude, north slope of Harquahala Mountains, Yuma County, Arizona.) Additional subspecies. Harquahala Mountains, Arizona, between 3000 and 5000 feet.
344. *Amphispiza bilineata carmenae* van Rossem. CARMEN BLACK-THROATED SPARROW. [573e.] *Amphispiza bilineata carmenae* van Rossem, Trans. San Diego Soc. Nat. Hist., vol. 10, no. 13, August 31, 1945, p. 243. Salinas Bay, Carmen Island, Gulf of California, Baja California.) Additional subspecies. Carmen Island, Baja California.
355. *Passerella iliaca mariposae*, given in the Twentieth Supplement, Auk, vol. 62, no. 3, July, 1945, p. 449, as a synonym of *Passerella iliaca monoensis*, on further investigation is placed instead as a synonym of *Passerella iliaca megarrhynchus*. See Grinnell and Miller, Pac. Coast Av., no. 27, December 30, 1944, p. 449.

GENERAL NOTES

A new Tyrant Flycatcher from Colombia.—Several years ago, Brother Nicéforo Maria of the Instituto de La Salle, Bogotá, Colombia, forwarded a collection of Colombian birds for identification, amongst which was a specimen of *Muscisaxicola maculirostris*, the first example of the species known from Colombia. Although the specimen showed a certain amount of difference from a good series of typical *maculirostris* from Argentina, Bolivia, Chile, and Perú, it seemed probable that the Colombian bird represented an individual variant of this form in winter quarters, aside from the fact that its migratory movement to Colombia was not previously suspected.

Subsequently, Brother Nicéforo published the record [Caldasia, 3 (14): 386-387, 1945] in connection with other Colombian specimens in his possession taken in October, 1922, 1923, and February, 1924. More recently, Dr. Alden H. Miller obtained a bird near Leiva, Dept. of Boyacá, which he has kindly submitted for study, and comparison of this specimen with the earlier Colombian example at hand shows the same differences from *m. maculirostris* that were noted in that individual. Added to this observable distinction is the fact that typical *maculirostris* is found in its southern breeding range throughout the year and probably does not move far, if at all, in the southern winter. Furthermore, its breeding range appears to stop in northern Perú, and the very different *M. m. rufescens* replaces it in Ecuadorian terrain, effectively interposed between *maculirostris* and the newly discovered Colombian population. Still more, the October records published by Brother Nicéforo place the species in Colombia in October which is, apparently, the breeding season of *maculirostris* in Chile and presumably other parts of its range.

With these various facts in hand, it is certain that the Colombian population represents a distinct subspecies and I propose its recognition as follows:

Muscisaxicola maculirostris niceforoi, new subspecies

TYPE from the mountains of Bogotá, Colombia. No. 308684, American Museum of Natural History. Adult (sex undetermined) collected in February, 1922 [? by Nicéforo Maria].

DIAGNOSIS—Similar to *M. m. maculirostris* of Bolivia, Perú, Chile, and Argentina, but dorsal coloration darker and grayer, less brownish.

RANGE.—Temperate Zone of the Eastern Andes of Colombia.

DESCRIPTION OF TYPE—General color of upper parts light Hair Brown, becoming blackish on longer upper tail-coverts; lores dusky, surmounted by a soiled whitish stripe from the base of the bill over and around the orbit; a postocular stripe and the posterior part of the auriculars like the dorsum; chin and throat whitish; breast slightly buffy, with obsolete darker stripes; sides darker, approaching the dorsal coloration; belly near Pale Pinkish Buff; flanks a little deeper, near Pinkish Buff; under tail-coverts somewhat whiter. Wings dark brown with narrow, pale outer margins and tips on the remiges and upper wing-coverts; under wing-coverts whitish, slightly buffy; inner margins of remiges toward the base Pinkish Buff. Tail blackish; outer web of outermost rectrices largely whitish but with the tip blackish and the base brownish narrowly margined with whitish. Bill (in dried skin) black except for pale yellowish white basal half of the mandible; feet black. Wing, 84.5 mm.; tail, 58; exposed culmen, 12; culmen from base, 16; tarsus, 25.

SPECIMENS EXAMINED

M. m. maculirostris.—Argentina: 3 ♂, 6 ♀, 1 (?). Chile: 11 ♂, 9 ♀. Bolivia: 22 ♂, 7 ♀. Perú: 32 ♂, 16 ♀, 9 (?).

M. m. rufescens.—Ecuador: 10 ♂, 8 ♀, 3 (?).

M. m. niceforoi.—Colombia: mountains of Bogotá, 1 (?) (type); 5 kil. west of Leiva, Boyacá, 1 ♂ 1.

1. Specimen in Museum of Vertebrate Zoology.

I take pleasure in naming this new form for Brother Nicéforo Maria who has done so much to clear up our knowledge concerning the bird life of his country.—JOHN T. ZIMMER, *American Museum of Natural History, New York, N. Y.*

A new zonal race of the Gentoo Penguin.—*Pygoscelis papua* was described by Forster in 1781 from Falkland Island specimens. More recently subspecific names have been applied to representatives of the species from islands in the southern Indian Ocean and elsewhere. As reported in 'Oceanic Birds of South America' (1936), I have been unable to confirm the criteria of discrimination, but the report of R. A. Falla (B. A. N. Z. Antarct. Research Exp., 2: 54, 1937) indicates that important taxonomic analysis remains to be undertaken.

Commander Lincoln Ellsworth, following his Trans-Antarctic Flight of 1935, presented to the American Museum of Natural History five specimens of the Gentoo Penguin from Deception Island, South Shetlands. These birds differ markedly from our Falkland and South Georgia examples in the smallness and relative weakness of their bills, as well as in the lesser dimensions of wing and foot.

I have learned also from oral discussion that the distinctness of the Gentoo Penguin inhabiting the American Quadrant of Antarctica, from the subantarctic and "low antarctic" birds of the Falklands and South Georgia, respectively, has been recognized in the field by several experienced British naturalists, including Brian Roberts.

Unfortunately, the sex of Ellsworth's birds was not determined, for which reason I have selected as the type of the new form a male collected at Deception Island at an earlier date.

***Pygoscelis papua ellsworthi*, new subspecies**

CHARACTERS: Differs from *Pygoscelis papua papua*, of the Falkland Islands, in being smaller, and in having a shorter bill, more slender terminally and with a notably reduced culminicorn.

MEASUREMENTS IN MILLIMETERS

	Bill from gape	Culmen	Width of maxilla at nostril	Wing	Tail	Foot, with claw
<i>P. p. ellsworthi</i> ♂, Type (figured specimen).	73.2	45.4	12	193	(in molt)	117.7
AMNH 196165. ♂, Deception Island, Dec. 2, 1921, A. G. Bennett.	76.5	47.2	13	202	154.1	(bent)
AMNH 442412, 3, 4, 6, 8 (5 specimens), sex unde- termined, Deception Island, Jan., 1935, Lincoln Ells- worth.	63.4- 75.1	40.2- 51	11.3- 12.1	189- 198	108- 124	99- 109
<i>P. p. papua</i> AMNH 445221. ♂, Falkland Is- lands, Oct. 10, 1915, R. H. Beck (figured specimen).	85.6	60	14.1	227	151.5	142.3

TYPE: No. 196164 AMNH, ♂ adult, Deception Island, South Shetlands, March 2, 1922, A. G. Bennett.

RANGE: The South Shetland Islands and the West Antarctic Archipelago, southward at least to Petermann Island and probably to the vicinity of the Antarctic Circle.



TEXT-FIGURE 1.—(Left) *Pygoscelis papua papua* ♂ 445211, topotype; (Right) *Pygoscelis papua ellsworthi* ♂ 196164, type. (Drawn by Alexander Seidel)

The tail measurements are unsatisfactory for comparison because of the season and the stages of molt and growth. It is worth noting that Gain, of the Second French Antarctic Expedition 1908–1910, found that Gentoo Penguins from West Antarctica had extraordinarily long tail quills, measuring up to 200 mm. Bennett's label records the total length in the flesh of one Deception Island male as 865 mm.—ROBERT CUSHMAN MURPHY, *American Museum of Natural History, New York.*

Cuban Nighthawk a species, rather than a race, additional to the Check-List.—In editing the manuscript of Earle R. Greene's 'Birds of the Lower Florida Keys' (Florida Audubon Soc. Special Bull., 1946), my attention was attracted by what he wrote about the voice of the Cuban Nighthawk as brought to his notice in 1941 by Roger T. Peterson (Auk, 60: 105, 1943). "The call notes of this Cuban race," writes Greene, "are different from those of the Eastern and Florida Nighthawks, consisting of three or four notes expressed as 'killy kadick' by Cubans living along the keys . . ." Upon my suggesting to Alexander Wetmore that this difference might well indicate that the Cuban bird is a distinct species, he referred me to his statement of that view in 'The Birds of Haiti and the Dominican Republic' (Wetmore and Swales, U. S. Nat. Mus., Bull. 155: 256–257, 1931). There he contrasts the sounds made by the Cuban *gundlachi* and the Bahaman *vicinus* with those of the North American *minor* and, while noting the lack of trenchant differences in the skins, states that he is convinced the West Indian forms are specifically distinct.

From a collection of vernacular names of the birds, other items of historical and biological value may be gleaned. For one thing, the very syllables quoted by Greene from Cubans on the Florida Keys were recorded in 1905 by Glover M. Allen (Auk, 22: 126) as the name, "killy-ka-dick," of *vicinus* in the Bahamas. As early as 1863, March in 'Notes on the Birds of Jamaica' (Proc. Acad. Nat. Sci. Philadelphia, 15: 285, 286), recording "piramidig" as the name of the local form, added, *C. popetue* "is the large night or mosquito hawk." "Piramidig" has been recorded as a name of the North American bird, but in error; it traces back to Gosse's 'Birds of Jamaica' (p. 33, 1847), has been recorded in identical form by Northrop for Andros Island (Auk, 8: 72, 1891), and in the recognizably similar term "pira-mi-dink" by Cory for the Bahamas (Birds of the Bahama Islands: 106, 1890). Attempts to syllabify the call of these small nighthawks of the West Indies have resulted in such terms as the following in three languages:

English	French	Spanish
chitty-chitt	pain voie	berequetec
diggery-dick	peut-on-voir	caracatey*
gie-me-a-bit		cericaday*
killy kadick		querebebé
pyramidig		querequequé
pira-mi-dink		querequeté
		querequetec

Thus there is wide recognition that the call note of the small Antillean nighthawks is a four-syllabled (rarely three-syllabled) sound. That of the common mainland species usually is rendered as one-syllabled, viz.: beedz, beerb, peeck, peent, or pisk. A few ears hear it as of two syllables. This difference in notes is a striking biological distinction. Biological species are regularly recognized in some groups of organisms such as the bacteria and rusts, and the advisability of accepting them has been proposed for other phyla. Perhaps the time has come to lean more in that direction in the classification of birds. The evidence in the present instance seems relatively as weighty as that in the *Sturnella magna*-*S. neglecta* case, in which difference in song is the most obvious distinguishing character.—W. L. McATEE, Chicago, Illinois.

Wryneck from Cape Prince of Wales, Alaska.—Another Old-World species (*Jynx torquilla*) was added to our North American list when Dwight Tevuk secured a male (C. M. N. H. no. 24570) at Wales, Alaska, on September 8, 1945—a remarkably late date for a small bird from near the Arctic Circle. *J. t. chinensis* is the subspecies found on the Siberian mainland and the form most likely to occur accidentally in Alaska, but Dr. Herbert Friedmann, to whom I submitted this specimen, thinks it is best referable to *J. t. harterti* of central Asia, which Hartert did not recognize as distinct from the nominate *torquilla*. In any case, whatever the subspecific identity of this bird may be, the species is new to North America. I am indebted to Dr. Friedmann for the identification.—ALFRED M. BAILEY, *The Colorado Museum of Natural History, Denver, Colorado.*

Sublegatus arenarum—a correction.—Mr. Eugene Eisenmann of New York City has called my attention to an unfortunate error in my account of the species of *Sublegatus* in my 'Studies of Peruvian Birds,' No. 37 (Amer. Mus. Novitates, No. 1109: 1-7, 1941). In that paper I recognized a "glaber" group as specifically distinct from the *modestus* group, but in so doing overlooked the fact that *glaber* was not the oldest available specific name, being antedated some five years by *arenarum*, belonging to the Costa Rican form. Consequently, my "glaber" group should properly bear the specific name *arenarum*, applicable to the subspecies *peruvianus*, *sordidus*, *obscurior*, *orinocensis*, *glaber*, *atrivostris*, *pallens*, and *arenarum*, and the more recently described *tortugensis*.—J. T. ZIMMER, *American Museum of Natural History, New York, N. Y.*

Hippoboscid parasite from Screech Owl.—On October 4, 1946, an adult female Eastern Screech Owl of the red color phase was taken in a basement room at Fernald Hall, Amherst, Massachusetts. It had apparently gained entrance through the flue of a ventilating funnel. The bird was chloroformed in preparation for making a study-skin. In the chloroform jar a parasite was seen to drop from its feathers. On examination this proved to be an adult winged female specimen of *Ornithoica*.

* These two probably are English versions of some of the terms beginning with "q."

The specimen was sent to Professor Joseph Bequaert at the Museum of Comparative Zoölogy for identification. In view of Professor Bequaert's determination of the parasite as the species *O. vicina* (Walker) and the fact that many records of *O. confluenta* have been published for passerine, strigiform, and falconiform birds, it seems advisable to make known his conclusion. In correspondence he advises that the species *O. confluenta*, as defined by Say, is restricted to wading birds and that the species occurring on passerines, falcons, and strigids should be designated as *O. vicina* (Walker) since it appears to be distinct from the species so far known to occur on the wading birds.—L. M. BARTLETT, *Massachusetts State College, Amherst, Massachusetts.*

Waterfowl grounded at the Muleshoe National Wildlife Refuge, Texas.—That waterfowl may share with the airplane difficulty in taking off from a wet field was the observation of the writer during the winter of 1945-1946 when he watched wintering ducks attempt to arise from muddy fields at the Muleshoe National Wildlife Refuge, Texas. Following the mid-January snowstorms, the clay soils of dry lake bottoms where the ducks gathered daily to rest became surprisingly viscous, adhering tenaciously to their feet and legs with the result that when many attempted to fly they were so weighted down with the sticky mud that they could not rise and fell easy prey to predacious birds. Struggling created puddles about the birds and in many instances added to the accumulation on wings, breasts and legs to such an extent that death undoubtedly resulted from exhaustion. Representative examples were the Mallard (*Anas platyrhynchos platyrhynchos*), one of which had acquired 14 ounces of mud on its feet and legs, and a Pintail (*Anas acuta tsitsihua*), from which one pound 11 ounces of the gumbo were removed. Before prairie winds altered the condition by drying the wet surfaces again, an estimated 500 ducks were lost.—EDWARD J. O'NEILL, *Muleshoe National Wildlife Refuge, Muleshoe, Texas.*

Purple Martins killed on a highway.—Much has been written concerning the mortality of Tree Swallows by cars along the highway. The following account concerns a similar type of destruction of another member of the swallow family. On September 10, 1940, while driving down to Bull's Island, S. C., with Dr. Edward Fleisher and Mr. Irwin Alperin, we passed over a low bridge spanning Albemarle Sound, N. C. We noticed hundreds of dead birds all along the bridge, but due to its narrowness, did not stop the car until we reached the other side. Upon returning on foot, we identified them all as Purple Martins. There were no live birds present, nor were there any dead birds along the road, except those present on the bridge. Our only deduction that seemed plausible in explaining this mortality was that the martins had chosen the bridge railings to roost at night, and flew into blinding headlights of cars as they traversed the sound.—DR. M. A. JACOBSON, *New York, N. Y.*

Hooded Merganser and a watersnake.—On August 21, 1941, while birding along the shore of a small lake at Glen Spey, N. Y., about fifteen miles from Port Jervis, a considerable commotion about three hundred yards distant, on the otherwise very placid lake surface, attracted my attention. Wishing to investigate at a closer range, after an unsuccessful view with my binoculars, I leaped into a near-by boat and rowed out to the site, and came in time to fish out a female Hooded Merganser with a common watersnake entwined about its neck. I had forcibly to remove the snake, which when finally loosened, slithered its three and one-half feet back into the lake. The merganser appeared in labored breathing, and made but feeble attempts to escape my driving with its bill.

When I arrived at shore the bird seemed to be gasping its last few breaths. On stethoscopic examination, the heart sounds were barely discernible. We attempted an intra-cardiac injection of adrenaline which apparently had no effect. A second dosage still showed no change in the bird's condition, and shortly afterward it succumbed. Whether we did succeed in inserting the hypodermic in the heart muscle is a matter of conjecture. Then again, we employed a very small dosage of the drug, which might not have been sufficient.

We did not perform a post mortem, so I can not state in just what manner the trauma inflicted by the snake, caused the bird's demise. Nevertheless, I have never heard or read of any previous duel between these two animals, and thought this note might be of interest. The final analysis of the event would lead one to the obvious conclusion that the merganser had attempted to make a meal of the snake, with an unfortunate reversal!—DR. MALCOLM A. JACOBSON, 57 W. 57th St., New York, N. Y.

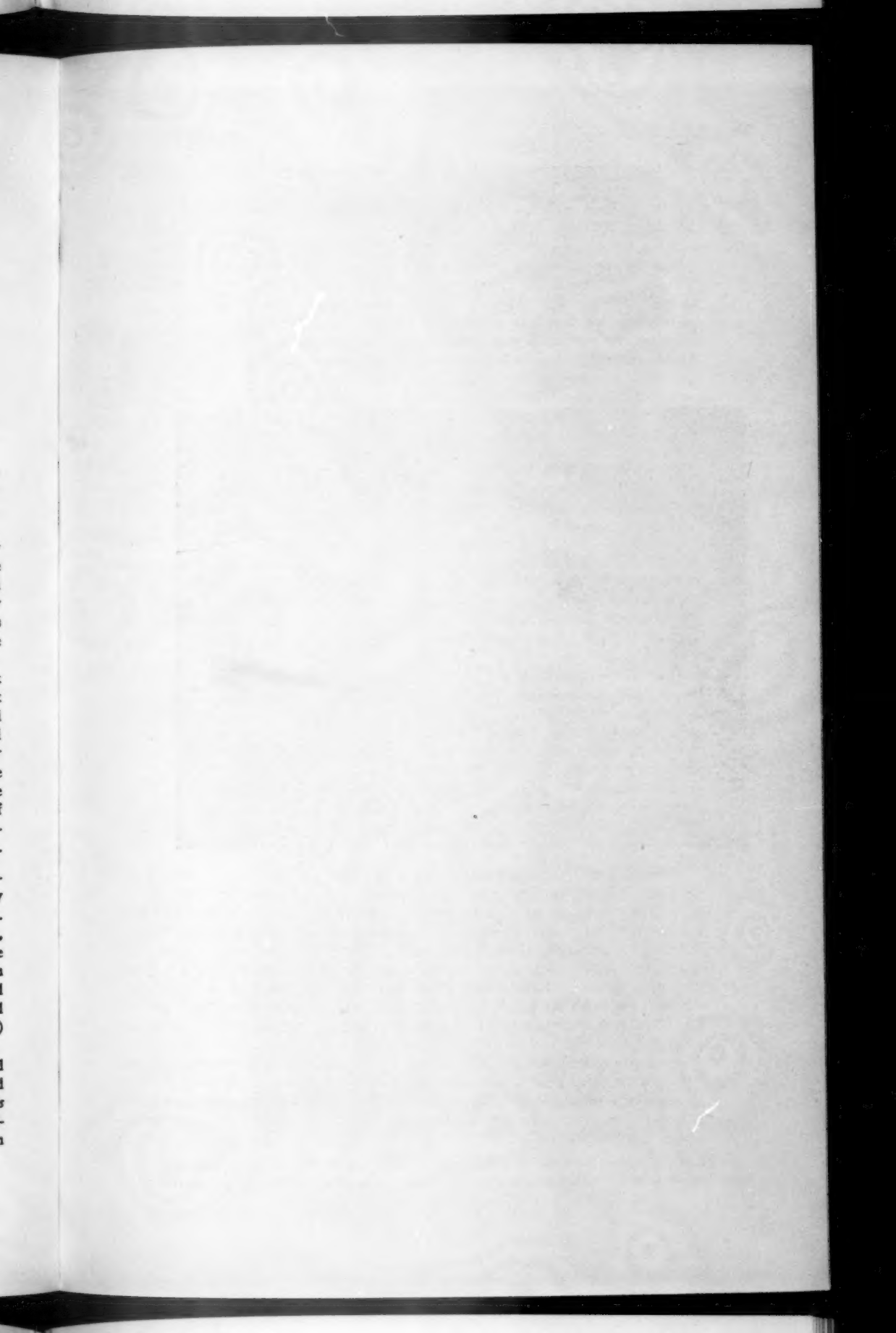
Starlings catching insects on the wing.—In summer, it is common to see the Starling (*Sturnus v. vulgaris*) catching insects on the wing as does a flycatcher around its perch. However, I believe it is an unusual behavior for the Starling in full flight to feed on insects, as is customary for a swallow.

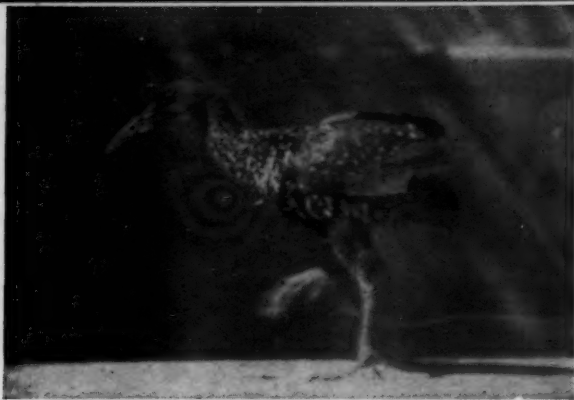
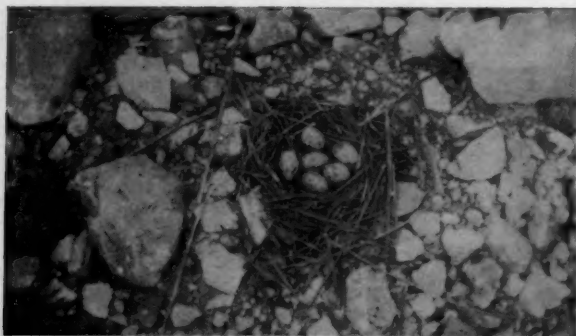
On April 12, 1945, at the Quebec Zoological Garden, Charlesbourg, Quebec, I saw in the distance a flock of birds circling rapidly like swallows. Knowing that the swallows at that time were not yet back from their wintering grounds, I approached the birds more closely, and with my binoculars, at about 200 yards, I saw that they were Starlings. It was about 11 A. M., the sky was clear and the temperature was from 65° to 70° F. Many insects, mostly Coleoptera, were slowly flying about in the calm, warm air.

About 15 Starlings were flying at a height of 75 to 100 feet, circling overhead, but remaining in the same general area. Some were zigzagging, giving sharp and quick strokes of the wings at each turn; others, likely having missed their prey, fluttered their wings on the spot a few seconds, and shortly pursued the prey vertically toward the sky or to the ground in swift gliding flight. That performance lasted two or three minutes with the entire flock taking part in it. Later in the day, the same flight performance was repeated by single birds at or near the same place. The performance was not observed later in the season, though that particular flock of Starlings nested in the vicinity and was observed almost daily throughout the summer.—RAYMOND CAYOUILLE, *La Société Zoologique de Québec, Charlesbourg, Québec.*

Birds that eat Japanese beetles.—Although the Japanese beetle (*Popillia japonica*) has for some years been one of the East's worst summer insect pests, the only list of its bird enemies that I have been able to find is that of Hadley and Hawley (U. S. Dept. Agric., Circ. 332: 19, 1934), who term the Purple Grackle, European Starling, Cardinal, Meadowlark, Catbird, English Sparrow and Robin "some of the more important" feeders on adult beetles, and credit the grackle, Starling and Crow with feeding on larvae. I have already (Wils. Bull., 55: 79, 1943) mentioned the Wood Thrush (*Hylocichla mustelina*) and Louise F. A. Tanger (Bull. Lanc. Co., Pa., Bird Club, No. 7: 5-6, 1945, mimeog.) mentions the Brown Thrasher (*Toxostoma rufum*) as feeding on adults.

Observations in Baltimore in 1945 and 1946 enable me to add the Red-headed Woodpecker (*Melanerpes erythrocephalus*), Blue Jay (*Cyanocitta cristata*), Kingbird (*Tyrannus tyrannus*), Scarlet Tanager (*Piranga olivacea*) and Mockingbird (*Mimus polyglottos*) to the roll of feeders on adult beetles. Of these, the Red-headed Woodpecker has been the heaviest feeder; a few of the birds visited a badly infested elm





(Top) WARBURTON: COMMON TERN'S NEST. (Middle) PLATH: ALBINO WHITE-THROATED SPARROW. (Bottom) FRIEDMANN: SPOTTED RAIL, IN SOUTHERN MÉXICO.

many times a day during more than a week that it was watched, and single birds captured beetles at rates as high as 12 in 10 minutes. As for the other species, I have from two to a number of observations for all but the Mockingbird, which I have only once seen eating beetles.—HERVEY BRACKBILL, 4608 Springdale Avenue, Baltimore 7, Maryland.

Some insect food of the Yellow-headed Blackbird.—Stomachs of fifteen Yellow-headed Blackbirds, *Xanthocephalus xanthocephalus*, have been collected from marshes and near-by farms of northern and central Utah since 1940. Examination of the stomach contents revealed in recognizable form the following insects: 7 Orthoptera, mostly grasshoppers; 1 larval aphid lion; 7 naiads of damsel and dragonflies; 2 Hemiptera. Of the 96 beetles recognized, 13 were ground beetles, 2 predacious diving beetle larvae, 1 dermestid, 1 ladybird, 2 scarabaeids, 7 leafbeetles and 18 weevils, among them 4 alfalfa weevils, 2 clover leaf weevils and 1 rough strawberry weevil. There were 40 lepidopterous caterpillars recognized, 18 being cutworms and armyworms; of 13 Diptera, 4 were larval and 1 an adult horsefly, and 7 larvae of other kinds; 10 Hymenoptera included 7 ants. In addition were insect, plant and seed fragments, 2 spiders and 109 seeds, mostly of weeds. Cultivated crop seeds recognized were 18 wheat, 22 oat and 6 barley kernels.—G. F. KNOWLTON, Utah State Agricultural College, Logan, Utah.

Common Tern's nest with seven eggs. (Plate 16, top figure.)—On June 27, 1944, I found in a large nesting colony of Common Terns (*Sterna hirundo*) one nest containing the surprising number of seven eggs. As I was only fifteen at the time, and relatively inexperienced, I did not realize what a rarity this was or I should have reported it sooner.

The nest was one of a very large number on the "Wing Dyke," a long, narrow, artificial island of limestone gravel about a quarter of a mile from the Canadian shore of the Detroit River, and directly opposite Amherstburg, Ontario.

Such a large number of eggs—which I believe might very well be unique for this species—might possibly not be a natural occurrence. A few anglers and other people frequent the dyke and one may have for some unknown reason placed a number of extra eggs in this nest. The eggs, however, were all very similar in shape, size, and markings, and this fact seems to indicate that they were all laid by the same bird. Unfortunately, I had very little opportunity for sustained observation of this nest, and as from a distance it was indistinguishable from the (literally) hundreds of nests surrounding it, I cannot even say definitely whether the eggs were brooded or deserted. When the accompanying photograph was taken one of the eggs had disappeared, but whether it had hatched or been stolen I am not prepared to say.

Several other nests in the colony contained four eggs, but the usual number was two or three as one would naturally expect. It is difficult to estimate the total population of the colony, but I believe that the number of occupied nests would lie between 700 and 1000. An estimate made on May 24, 1944 (long before the height of the nesting season), and based on actual counts made in characteristic areas, was between 500 and 600 nests, with an average of 1.9 eggs in each occupied nest. This estimate completely ignores those nests which apparently were ready for occupancy but did not then contain eggs. This number would probably increase greatly by the middle of June. In some small, especially desirable areas, barely more than a yard separated each nest from its nearest neighbor.—FREDERICK E. WARBURTON, Owen Sound, Ontario.

The Spotted Rail, *Pardirallus maculatus*, in southern México¹ (Plate 16, bottom figure).—In the summer of 1946 I received a letter from Señor Miguel Alvarez del Toro, a young ornithologist associated with the Museo de Historia Natural, Tuxtla Gutierrez, Chiapas, México, informing me that he had alive in a cage a Spotted Rail captured in a marsh about seven kilometers west of the city a year before. Further correspondence brought out the fact that the bird was indeed *Pardirallus maculatus*, a species new to the Mexican fauna, but that the bird was in such worn plumage that, if killed and skinned, it would be almost useless for comparison with the unique type of the geographically nearest race, *insolitus*, of Ycacos Lagoon, British Honduras. I therefore suggested that the bird be kept alive until it had a chance to grow new feathers (its abraded ones being also apparently "grown in captivity" and being no less subject to suspicion on these grounds than would be the new ones), and that, in the mean time, to substantiate the record, photographs be made of it, and notes made of the colors of the soft parts, voice, habits, etc. Señor del Toro has now sent me two photographs, one of which is herewith reproduced, and which proves that the bird is the little-known Spotted Rail, *Pardirallus maculatus*. Whether it is of the same race as the British Honduras bird or represents still another, as yet undescribed, form, cannot be ascertained at this time. Together with the photographs came the following notes on the soft parts: "bill olive greenish with two laterobasal reddish plates; iris dark red; tarsi and toes red or dark pinkish red." The credit for this interesting addition to the avifauna of México and for the descriptive data rightfully belongs not to me but to Señor del Toro, who has asked me to write this note and have it put on permanent record.—HERBERT FRIEDMANN, U. S. National Museum, Washington, D. C.

Albino White-throated Sparrow (Plate 16, middle figure).—The albino White-throated Sparrow shown in the photograph was brought in by Karl E. Bartel who got it in his banding trap at Oak Hill Cemetery, Blue Island, Ill., on October 19, 1946. Mr. Bartel has done splendid work in bird-banding and usually averages 1000 birds a year. The photograph is by Watland brothers.

This bird is nearly all white, with a faint tinge of cinnamon on the wings and tail and enough contrast on the crown to show the superciliary stripe which is strongly yellow before the eyes. There is also a tinge of lemon yellow on the edge of the wing. The eyes appear to be very dark. In our collection at the Brookfield Zoo we also have an albino English Sparrow which also has the cinnamon tinge but in winter and spring is practically pure white. A third perfect albino specimen with pink eyes is a beautiful Robin, snow white all over. It was brought in from Iowa. We did have a handsome albino Robin for nine years—all white with a pink flush on the breast.—KARL PLATH, Chicago Zoological Park, Brookfield, Illinois.

Another partial albino Robin.—Warburton reported recently (Auk, 63: 593, 1946) three records of partially albino Robins (*Turdus migratorius*) observed in the spring of 1946. On September 18, 1946, I observed one similar to those described in his note. At 7:30 A. M. a mixed flock of Robins and Starlings appeared in my yard in Kent, Ohio. A male Robin was conspicuous in the flock because of the following irregularities of plumage: the left two or three outer tail feathers were completely white; the tips of the first several primaries of the left wing were pure white, giving the appearance of an asymmetrical rump-patch while the bird was on the ground; the post-nuchal region of the back was saddled with a speckled grayish-white band; the breast was suffused with milky white patches. The bird was observed at close range

¹ Published by Permission of the Secretary of the Smithsonian Institution.

for about five minutes. It was normal in all other aspects of topography and in behavior. It is interesting to note that this bird, like two of those described by Warburton, was asymmetrical in pattern with the left side having the greater amount of white markings.—RALPH W. DEXTER, *Kent State University, Kent, Ohio.*

Hidden note on the Passenger Pigeon.—Had the work here cited come to my attention when I was preparing 'Birds of the vicinity of the University of Indiana' [Proc. Ind. Acad. Sci., 65-202, 1904 (1905)], it would have been treasure-trove. Even now, seeing that it is not mentioned in general accounts of the Passenger Pigeon nor in Butler's 'Birds of Indiana' [22nd Ann. Rep. Ind. Dept. of Geol., 1897 (1898)], it should be noted in an indexed ornithological journal for the benefit of future researchers. The book concerned is 'The New Purchase' by Baynard R. Hall (pseudonym, Charles Clarence), first published in New York, 1843, but most readily available in the Indiana Centennial Edition, Princeton University Press, 1916. The chapter devoted to a much frustrated pigeon hunt, running from pp. 466 to 474 in this book, was on pp. 253-264 of Vol. 2 of the first edition.

In the vicinity of Bloomington the autumn, apparently of the year 1828, "was remarkable for wild pigeons. The mast had failed elsewhere; while with us, the oak, the beech, and all other nut trees had never borne more abundant crops. . . As to pigeons, the first large flocks, attracted no unusual notice: and, yet, they were mere scouting parties from the grand army! For within a week. . . Had the leaves of our trees all been changed into birds, the number could have been no greater!" The author writes of the flight of the pigeons as "an endless hurricane on wings . . . with such an uproar as seemed to be prostrating the forests." He refers to a "Grand Roosting Encampment", noting that never, in the memory of our oldest inhabitants, had the pigeons roosted so near (some three miles from) the College town. The editor, J. A. Woodburn, born in 1856, records seeing in childhood similar flocks of wild pigeons and states that there was a roosting place ten miles south of Bloomington. Quoting Hall again, he refers to the birds flushed from the roost in the following language: "Hark! a storm rushes this way! How sudden the moon is hid! Is that a cloud? Yes, reader, it was a storm—but of pigeons rushing on countless wings! It was a cloud—but of careening and feathered squadrons! The moon was hid—and by a world of startled birds."

Those of us who never saw a Passenger Pigeon, and that includes 95 out of 100 living ornithologists, can only try to imagine the numbers of those birds and the grandeur of their flights. No other American bird, and perhaps no bird in all the world, is known to have assembled in such hordes, flown with such momentum, rivaling the very storm for turbulence and tumult, and obscuring the light of the sun or moon.—W. L. MCATEE, *Chicago, Illinois.*

American Egrets nesting on West Sister Island in Lake Erie.—On June 16, 1946, a party of 15 members and guests of the Toledo Naturalists' Association discovered a small colony of six nests of the American Egret, *Casmerodius albus egretta* (Gmelin) on West Sister Island in Lake Erie. Laurel Van Camp of Genoa, Ohio, and I were acting as leaders of the group. Of the six nests one held four nestlings, one held three, two held two each, one contained one nestling, and the contents of one nest (either eggs or very small young) could not be determined. All the nestlings were completely feathered and a few climbed out on branches when disturbed. Ten of them were banded.

West Sister Island, the most westerly of the Lake Erie island group, belongs to Lucas County, Ohio. It lies about eight and three-quarter miles northeast of Jeru-

saalem Township, Lucas County. West Sister rises abruptly from the water for most of its shore line from ten to twenty feet. It is formed of limestone with a rather thin layer of soil on top. About 20 per cent of its 90 acres is in blue grass, nettles, shrubs, etc. The remainder is primarily hackberry forest. For several years the island has been a Federal game refuge.

The outstanding bird feature of the island is a large roost of Black-crowned Night Herons numbering 500 to 1500 nests. About 100 pairs of Great Blue Herons also nest there. Local ornithologists were of the opinion that Egrets nested on West Sister in 1945 as several of these birds were noted flying back and forth regularly between the island and the mainland, but all proposed trips had to be cancelled because of stormy weather or government wartime regulations. The Egrets nested together within the heronry.

American Egrets were first seen in numbers in Lucas County in 1930. Since that time they have been found regularly each fall and occasionally in spring with an outstanding visitation in the fall of 1933 and of 1939. On May 18, 1940, Dr. Lawrence E. Hicks found a nest of this species containing four eggs on Eagle Island, Sandusky Bay, Sandusky County, Ohio [Wilson Bull., 56 (3): 169, Sept., 1944].—LOUIS W. CAMPBELL, Toledo, Ohio.

The Mountain Vireo nesting for the first time in the Lower Piedmont Plateau of Georgia.—According to the A. O. U. Check-List (4th ed.), the breeding range of *Vireo solitarius alticola* is "the Canadian and Transition zones of the Alleghenies from western Maryland to eastern Tennessee, and northern Georgia." In the 'Birds of Georgia' (Greene, *et al*, 1945) the Mountain Vireo is listed as a common summer resident in the mountains, a transient in the rest of the state.

There are records in 'Birds of North Carolina' (Pearson, *et al*, 1943) of this species breeding in the Piedmont Plateau (Upper Austral) of North Carolina as far east as Raleigh. Eugene P. Odum considered the Solitary Vireo a local summer resident at Chapel Hill, N. C., finding it nesting in upland pine woods (Jour. Elisha Mitchell Scientific Society, 51: 312, 1935). In the northern part of Georgia, Odum has breeding evidence for this race at the following southernmost points: Tallulah Gorge, extreme southern end of Rabun County; six miles north of Dahlonega, Lumpkin County; and base of Mt. Oglethorpe and Burnt Mountains, Pickens County (Oriole, 10: 48, 1945, and personal communication). All these localities are on the extreme upper edge of the Piedmont at low elevations, 1600 feet or so, but near the high Blue Ridge.

Odum and Burleigh in their recent article, 'Southward Invasion in Georgia' (Auk, 63: 388-401, 1946) listed the Solitary Vireo as one of the species showing recent invasion tendencies and stated that it "may be a good species to watch in the future even though very rapid changes probably are not to be expected." In view of the above knowledge it seems worthy to report the discovery of a nest containing three eggs, June 16, 1946, on the Piedmont National Wildlife Refuge, three and a half miles west of Round Oak, Jones County, Georgia, a location considerably to the south of the known range as indicated above. The Piedmont Refuge is on the extreme lower edge of the Piedmont about 18 miles from the 'Fall Line' at Macon, and has an elevation of 250-650 feet.

The lichen, paper-covered, pensile nest was on a lower limb of a small persimmon tree growing in open pine woods on a dry, eroded southerly slope; it was eight feet and nine inches from the ground. The closest tree to the persimmon was a four-inch loblolly pine tree at a distance of four feet. There were other small pine trees near the nest ranging from four to nine inches in diameter and 18 to 30 feet high. The nesting site was 93 feet from a shelter made out of galvanized tin for storage purposes,

156 feet from a metal grain bin, 125 feet from my garden and 400 feet from my residence. The nesting site, to say the least, is quite different from those I have observed at altitudes of 3000 feet and over in the moist ravines of the Great Smoky Mountains, but is similar to the Piedmont habitat of this species described by Odum (upland pine woods with deciduous understory).

The nest was constructed of dead grasses, leaves, bark, plant fibers, paper and lichens and was lined with fine grasses. The paper was obtained from waste paper which had been thrown into a near-by gully.

After the discovery of the nest, the brooding female was not disturbed until June 27 when several pictures were taken of her and the eggs. The female seemed unafraid and remained in the nesting tree while the pictures were being taken and the male bird made his appearance in the tree. The eggs hatched on June 28 and the nest was not visited again until dusk on July 1. The nestlings were in the nest but I did not see the parents about the nest. The following morning I looked into the nest and, to my dismay, the nestlings were gone. Thus, tragedy ended the existence of the first Mountain Vireo nestlings ever to be found on the lower Piedmont.

Mr. Thomas D. Burleigh, biologist, U. S. Fish and Wildlife Service, Atlanta, Georgia, made a special trip to see the nest and the brooding bird and confirmed my identification. Mr. Burleigh had planned to collect one of the nestlings for a skin but their destruction prevented this, so Mr. Burleigh made another trip to the refuge on July 8 for the purpose of collecting an adult for a skin to authenticate this discovery. Although a singing bird was located in the pine woods one-fourth mile west of the New Hope Church, which is two and one-half miles southwest of headquarters, attempts to collect it failed.

In addition to the nesting pair of vireos at refuge headquarters, I found the Mountain Vireo at eleven other widely separated places on the refuge and the Hitchiti Experimental Forest during the nesting season. A limited amount of field work was done in the adjacent counties of Bibb, Monroe and Jasper, but the only summer record of the species outside of Jones County is that of a single bird heard singing on July 26, 1946, in a pine woodland one mile north of Shady Dale, Jasper County.

Future field work by competent ornithologists on the refuge and the intervening area between Jones and Jasper Counties and the Blue Ridge Mountains of north Georgia should reveal whether this is a major invasion of the Piedmont of a permanent nature or an isolated colony nesting here with a vast expanse of unoccupied territory between the refuge and the mountains.—RAYMOND J. FLEETWOOD, *Fish and Wildlife Service, Round Oak, Georgia.*

Nesting of the Evening Grosbeak in Algonquin Park, Ontario, 1946.—Incidental to field work carried on at Lake of Two Rivers in Algonquin Park for the Department of Lands and Forests, Province of Ontario, during the summer of 1946, two nests of the Evening Grosbeak (*Hesperiphona vespertina*) were found.

During the last week of May, a road, about one and one-half miles in length, was bulldozed through a mixed forest of second-growth white pine, black and white spruce, balsam and birch. The action of the scraper exposed a myriad of rootlets which, after a few days, became dry and quite brittle. Coinciding with this period at least ten pairs of Evening Grosbeaks established themselves in what might be termed a loose colony, in woods adjacent to a section of this road. Pairs were frequently seen on the freshly graded earth. On June 10, a female, accompanied by her mate, was observed to carry off rootlets in her bill. On June 12, a similar observation was made and on this occasion we were fortunate enough to see where the material was taken and deposited. The performance was repeated several times, with only the

female carrying the material but always accompanied by the male. The nest, situated 28 feet from the ground in a black spruce, was left undisturbed until June 22 when it was collected. It was found to be placed close to the trunk some six or seven feet from the top of the tree and almost entirely hidden by dense foliage. It contained four slightly incubated eggs.

On June 21 a second nest was discovered 30 feet 5 inches up in a balsam. Like the first, it was invisible from the ground and was situated close to the trunk, six or seven feet from the top. It contained three eggs on the date mentioned. This nest was left undisturbed until July 6. It was then found to contain three partially fledged young. One, taken for a specimen, proved to be a male. The stomach contents consisted largely of comminuted vegetable matter. Fragments of cherry pip, insect fragments and two pieces of gravel were revealed by gross examination. The remaining two young left the nest on July 8.

The female of this latter nesting pair possessed an aluminum band on her left tarsus, the type of band normally used in bird-banding studies. However, we were unable to find out more about it. Judging by the dullness of the band, she had worn it for some time. The male did not possess a band. On July 6, in late afternoon, a male was captured at our banding station two miles away. Next day, July 7, the male at this second nest possessed a shiny new band on its left leg. Subsequently, part of the number was read through a high-powered telescope and it fitted the series we were using, proving almost conclusively that this bird had flown two miles from the nesting site to obtain salt which we used as bait at the banding station.

A point of interest concerning the structure of the two nests found is that from seventy-five to ninety per cent of the materials used consisted of rootlets such as were exposed in the newly made road. Oddly enough, the taking up of nesting territories adjacent to the road coincided with the exposure of unlimited nesting material.—C. E. HOPE, *Division of Birds, Royal Ontario Museum of Zoology, Toronto, Ontario.*

Random notes of bird life under shell fire.—My personal observations lead me to believe that the avifauna of Europe suffered least of all animal life from the effects of concentrated shell fire. My observations covered an area roughly bounded by the Vosges Mountains on the south, the Meuse River on the west, the Rhine-Dortmund Canal on the north, and the Saur Mountains on the east. This area had practically all of the various terrain features of Europe, and contained most of the various forms of bird life that are to be found in that continent. High wooded mountains, broad plains, open forests, and river valleys were all included in this area. Both spring and fall migration, as well as summer and winter residents, were under observation. A detailed study could not be made, but rather a general picture could be drawn.

Shell fire has two effects—blast and shrapnel. The first is deadly at close range, killing and maiming by blast alone. The second effect, shrapnel, is dangerous to a great range, as the flying bits of jagged iron carry to a considerable distance.

MORTALITY: I was unable to go into this very deeply, due to obvious facts. A battle field is not the correct place to gather specimens and dissect them to determine just what killed the birds. However I did have the opportunity to go over some of the areas after a heavy shelling and note the effect upon the bird life.

BLAST seemed to have very little destructive power on bird life, either wild or domestic. It was not uncommon to see cattle and horses lying dead with no marks upon them. This was especially true in barns, the roofs of which had been hit with a heavy projectile. Chickens, pigeons, and geese in the same farmyard were moving

about as if nothing had happened, yet dirt was driven into their feathers from the blast. At no time did I find a bird that one could definitely claim the blast had killed.

SHRAPNEL destroyed some bird life, but in a very small percentage. Only upon the banks of the Rhine did I notice any number at one time. However this was due to the habit of some varieties of alighting in the night on the river bars. Mortar rounds were fired into flocks of sleeping Lapwings. The birds moving around in the dark created enough noise to draw attention to them, and were subjected to a short concentration of fire. These bursts in a closely packed flock of birds ought to have slain them in great numbers, but in the morning very few were noted in the area. These birds were gathered and in all cases shrapnel had caused their death. It is my belief that the light comparative weight and small size saved the bird life from both blast and shrapnel, while mammal life near by, with a greater comparative weight and size, took the full force of the blast and created a larger target for the flying iron.

FOOD: This item seemed to be paramount. Often birds flocked to an area that had been, and still was, under a concentration of fire. I will try to divide this into two phases—the wooded areas and the agricultural areas. However, the feeding characteristics differ, and the effect of bursts differ in the two types of areas.

In the heavy woods, a great proportion of the shells burst on limbs or in tree tops. This created havoc with the trees, as blasts tore them apart and the iron gouged pieces of bark and wood from them. Close to St. Vith, in Belgium, we were dug in on a thickly wooded hillside. A heavy concentration of artillery fire was wrecking the forest about us. On both sides of this area the woods thinned out to brush, and it was from this brushy area that birds were flocking into the woods. Goldcrests (*Regulus r. regulus*) and Great Tits (*Parus m. major*) were identified in the horde of birds that descended into this woods. The tiny mites gave no evidence of fear as they cavorted in the broken trees. They seemed to congregate upon every shell burst, busily feeding upon insects exposed on the torn wood. The birds seemed to utilize the bursts in their search for food. A short time after the shelling ceased the birds thinned out. At no time during the several days spent in the area, did I locate a bird that had been killed.

In the open fields and orchards the majority of the shells burst on the ground. This blasted a hole, spreading the dirt about. During the summer, spring, and fall, no undue congregation of birds was noticed. However, utilization of the shell fire to expose food was again established. When winter with its snows arrived the situation immediately changed. Snow covered almost everything except the base of straw stacks and manure heaps. Here the birds could be found in great numbers. When shells screamed into a near-by orchard or field, however, the birds would immediately leave the straw stack and descend in mass upon the exposed ground. A great many grain and potato fields, as well as truck gardens, had been left and covered with a blanket of snow. The only way of uncovering this abundance of food was by shell fire, so all of the bird life took advantage of it.

FEAR: At no time was fear noted. As cited in the above paragraphs, the birds would dive into an area that was erupting with smoke and flame. The creatures would disappear in a burst and in a few minutes would be seen industriously feeding in the debris. The only time that sound seemed to affect bird life was when Nebelwerfers (Screaming Meemies) passed overhead. The terrific and terrifying sound would cause all of the bird life in the immediate area to become silent and motionless. Upon the impact of these rockets the flocks would immediately fly towards the point hit.

SHELTER: Some forms lost a portion of their natural cover, but in most cases the problem was reversed, with ample or added winter roosts. The forest dwellers had a portion of their area destroyed, but in Europe dead trees suitable for Tits and Woodpeckers are not found. These birds used nest boxes put in various places. They immediately moved into destroyed towns and villages. The hedge-dwelling varieties suffered, as hedges were methodically destroyed because snipers and tanks could use these hedges for concealment.

A great many forms took advantage of partially destroyed buildings during the winter months. It was no uncommon sight to see several birds perching on the dangling electrical fixtures in a windowless house. Picture frames and mantles were also frequently used. The accumulated droppings gave ample evidence that these perches had been used for some time.

MIGRATION: While we were on the Rhine in March, 1945, several flocks of migrating waterfowl were fired upon by both enemy and Allied anti-aircraft batteries. On several patrols at that time, mortar fire was called down upon suspicious noise that later proved to be migrating birds, as referred to in an earlier paragraph. In general, shell fire had little effect upon bird life. However, in the fall and early winter the effect was in reverse. Varieties that should have left remained in considerable numbers. Goldfinches (*Carduelis c. carduelis*) and Chaffinches (*Fringilla c. coelebs*) were present all winter in larger numbers than usual. I was not familiar with the migration in this area and had to take the word of the local inhabitants for this, but it seems reasonable, due to the extra amount of food that was exposed from the snow by the shells.

BREEDING: Adult birds remained on their nests and with their broods even when high-velocity shells were tearing their nesting trees apart. At Polsum, Westphalia, Germany, I noted three nests of some variety of *Corvus* in trees along both sides of a highway. PZVI tanks were firing up the highway, scoring tree bursts all along. One nest was cut out of its tree during the fighting. After the shooting was over I noted that the adult bird of this nest was still in the immediate vicinity and the other two brooding birds were more interested in the men below than in the burning building near by. This was the only case where nestling birds were noted in shell fire.

SUMMARY

This study is general and not on specific forms or areas. Data indicate that bird life is almost immune to blast and shrapnel. The relative small size reduces the chances of a shrapnel hit, but further study could be carried on as to the lack of blast effect. Shell fire aided bird life in securing food, especially during the winter months while snow covered the ground. In general the bird life benefited by concentrated artillery fire.—ROBERT R. TALMADGE, *Eureka, California*.

An unorthodox nest of the Rose-throated Becard.—While observing birds on the outskirts of Linares, Nuevo León, México, on June 13, 1946, the writers were attracted by the sharp call note of a nestling bird. Investigating further for the source of the note they were led to a bulky, nondescript nest in a small orange tree. The nest was approximately four feet from the ground with one end against the trunk of the tree and the bulk of the nest extending out along a main horizontal branch. A mass of dead leaves, grasses and even a few strands of small hemp rope constituted the nest, a structure measuring approximately two feet horizontally across the front, one foot high, and one foot from front to rear. The entrance was a hole near the center of the long side of the nest and was littered with droppings. Below on the leaves and ground other droppings were noticed.

The nestling, whose calls had attracted the writer's attention was found sitting on top of the nest near the trunk of the tree. Its feathers were just emerging from their sheaths. Within the nest were two more nestlings of the same species in the same stage of development.

Retiring to a point about 100 feet from the nest the writers watched an adult female Rose-throated Becard (*Platypsaris aglaiae*) come and feed the young, while the male becard moved about in a tree overhead, uttering its peculiar piercing cry from time to time. The male was not seen feeding the nestlings. One item of food being fed the young was a green insect, appearing to be some kind of orthopteron.

The day after the original discovery of the nest, the writers returned to the nest site and again observed the female parent feeding the young. One of the nestlings was found on the ground in a much weakened condition, and was presumably the one which had been perched on top of the nest the day before. It had been attacked by ants while still alive, and some of its flesh had been eaten in a small area around the base of the tail. This nestling was preserved in formaldehyde as a specimen. The two young within the nest were apparently in good condition and were left undisturbed.

The unusual location of the nest led the writers to consider the possibilities—first, of its having fallen from a branch of the large pecan tree above; and secondly, of its having been picked up by someone and placed in the orange tree. The nest location, however, was perfectly screened from above by stout branches, and the nest was fastened directly to the horizontal branch and crotch on which it was placed.

Because of the fact that the Rose-throated Becard has been generally noted to nest in a pendent structure the above-mentioned nest was considered to be worthy of record. Other nests of this species were seen by the writers in this general area and they were more typical, each hanging from the end of a slender limb a considerable distance from the ground. In conversations with other observers and by a perusal of the literature the authors have been unable to find that such a radical departure from the usual nesting habit has been previously noted.—STEPHEN W. EATON AND ERNEST P. EDWARDS, *Laboratory of Ornithology, Cornell University, Ithaca, N. Y.*

First winter observance of the Yellow-breasted Chat in South Carolina.—As has doubtless been the case with other localities during the unprecedented warmth of the fall and winter of 1946–1947, coastal South Carolina has exhibited some remarkable instances of delayed migration, or unusual wintering of avian species. One of the most outstanding of these was the observance, on January 11, 1947, of the Yellow-breasted Chat (*Icteria v. virens*) in Clarendon County, S. C., about 70 miles from Charleston. This appears to be the first winter record of this bird in the state and one of the very few from the entire southeast.

Accompanied by his wife, Mr. E. B. Chamberlain of the Charleston Museum, and three young and enthusiastic bird students, the writer was investigating parts of the Santee Wildlife Refuge (U. S. Fish & Wildlife Service) near one of the huge lakes created by the hydroelectric development known as Santee-Cooper. In an open, bushy area close to the side of one of the lakes, a bird flushed from low cover, and crossed our path. The vivid greenish cast of the upper plumage, the flash of white underneath and a fleeting glimpse of a white eye-ring and stripe, all immediately suggested a chat, but since this was all but unbelievable at this time of year, search was at once made to find the bird again. This was done without trouble, and in the next five minutes excellent views were obtained at close range, in the complete open, from various angles. The identification was as certain as though the bird had been

in the hand. The usual departure date for this species from coastal South Carolina is late August.—ALEXANDER SPRUNT, JR., *The Crescent, Charleston 50, South Carolina.*

The Broad-winged Hawk in winter on the South Carolina coast.—In his 'Life Histories of North American Birds,' Mr. A. C. Bent states that any record for the occurrence of *Buteo p. platypterus* in southeastern U. S. must be considered casual. This the writer has found to be completely correct during his many years of winter observation of Florida birds, as well as those of his native state of South Carolina. However, he observed an individual of this buteo on December 26, 1946, while on the annual Christmas Census undertaken locally under the auspices of the Charleston Museum and National Audubon Society. Accompanied by Mr. Robert Holmes, 3rd., of Mt. Olive, N. C., I was working a portion of Fairlawn Plantation, Christ Church Parish, Charleston County, when a hawk of this species soared overhead and alighted on a tall dead stub almost over us. Both recognized the bird almost simultaneously.

Four days later, on Dec. 30, on Bull's Island, while conducting members of the Audubon Wildlife Tour, the writer saw another of these birds at very close range, immediately overhead, with every marking distinct. It may well have been the same bird, for Bull's Island is hardly more than nine or ten miles in an airline from the spot where the bird was seen on the 26th.

This is the second time the writer has seen this species in winter in coastal South Carolina. The former occasion was on January 19, 1934, near his home across the Ashley River from Charleston. They apparently constitute the only winter records for the state.—ALEXANDER SPRUNT, JR., *The Crescent, Charleston 50, South Carolina.*

The Prairie Warbler in winter on the South Carolina coast.—Winter records for *Dendroica d. discolor* are excessively rare anywhere in the southeast and heretofore number only two for coastal South Carolina. The first of these was made by Walter Hoxie at Frogmore (near Beaufort) on February 19, 1891, and recorded in the U. S. Dept. Agriculture, Biol. Surv. Bulletin No. 18. In his 'Birds of South Carolina' (1910) Arthur T. Wayne discredits this observation of Hoxie's by stating that it is "unreliable" and that this warbler "could not possibly live in South Carolina at the time Mr. Hoxie records it." In *The Auk*, 39: 267, 1912, Wayne himself records an individual seen near his home on January 9, 1922 but which he failed to secure. In this account he does not allude to the Hoxie record at all.

On November 25, 1946, the writer, while conducting the Audubon Wildlife Tour group on Bull's Island, Charleston County, saw three adult, finely plumaged males in a small oak, only twenty or thirty feet overhead, and others of the party recognized them as well. As everyone knows, the fall and winter up to that date was a very mild one, and almost spring-like weather prevailed throughout November and December in South Carolina; azaleas, Cherokee roses and yellow jessamine were in bloom! This occurrence of *discolor* may therefore, well have been a belated instance of migration rather than a winter visit, but at the same time, the normal departure date of this warbler from this region is late October, and the above observation is at least a month behind time.—ALEXANDER SPRUNT, JR., *The Crescent, Charleston 50, South Carolina.*

Wilson's Warbler wintering in Florida.—What is believed to be the first wintering example of Wilson's Warbler (*Wilsonia pusilla*) in the southeastern United States came to the writer's attention on a field trip near Tallahassee, Florida, on January 1, 1947. The bird, an immature male or a female, was discovered in a leafless hedge of mock orange (*Citrus trifoliata*) on Ayavalla Plantation, situated six miles north of Tallahassee and on the eastern edge of Lake Jackson. During the period of

observation it remained constantly within this hedge, except for a single instance when it flew just above the hedge to capture a small flying insect.

Billy Cross, in company with the writer at the time of this observation, revealed that this was the same bird he had seen repeatedly since November and had previously mistaken for a female Hooded Warbler (*Wilsonia citrina*). Our observations on January 1, however, made with 6x and 8x binoculars, firmly established its identity as *pusilla* rather than *citrina*. Both Cross and the writer, who has had several years' experience with this species, observed the following points of identification at a range of less than ten feet: small size (scarcely larger than a Blue-gray Gnatcatcher observed near-by); absence of white on under side of tail; entirely yellow under parts and dusky olive cap; spread the rectrices (after the fashion of the Hooded Warbler); general behavior (more suggestive of the gnatcatchers than of the Hooded Warbler, e. g., the 'switching' of the relatively long tail).

There has been no attempt to collect this bird, as both observers are confident of its specific identity. Its subspecific identity, however, must remain open to doubt unless the specimen is collected later.—HENRY M. STEVENSON, *Department of Zoology, Florida State College for Women, Tallahassee, Florida.*

Blue Goose in Centre County, Pennsylvania.—A Blue Goose, *Chen caerulescens*, was observed on the College Pond, a small artificial empoundment on College land in the borough of State College, Pennsylvania, November 7, 1946, when the class in Game Birds and Mammals identified it along with other waterfowl. This goose is not a regular migrant through this area. The only other records for western Pennsylvania are those given by Todd (*Birds of Western Pennsylvania*: 77, 1940) recorded as follows: "*Chen caerulescens* Warren, Birds Pa., ed. 2: 49, 1890 (Pittsburgh, Allegheny Co., fide Hazzard)—Christy, Cardinal, 2: 42, 1927 (Erie Bay, Erie Co., October–November, fide Perry)—Oudette, Cardinal, 4: 121, 1935; and 5: 68, 1940 (Linesville, Crawford Co., October). 'Blue Goose' Christy, Cardinal, 3: 86, 1932 (Presque Isle, Erie Co., winter)—Savage, Bird-Lore, 34: 44, 1932 (Presque Isle, Erie Co., December)."

On November 15, 1946, I obtained permission from the borough police to shoot in the borough and collected this bird for the museum collection in the Department of Zoology and Entomology. The bird was emaciated and had many bird lice, several species of intestinal worms and a blood parasite. It weighed three pounds and fifteen ounces.—P. F. ENGLISH, *Dept. of Zoology and Entomology, The Pennsylvania State College, State College, Pa.*

The Flamingo in Kansas.—Mr. C. W. Lyon, a medical doctor of Ellinwood, Kansas, while writing to Mr. J. C. Mohler, Secretary of the Kansas State Board of Agriculture, made reference to a Flamingo shot near Ellinwood "a few years ago." The letter was referred to me by Mr. Mohler for further inquiry.

Correspondence with Doctor Lyon elicited a sketch of the specimen as it is now mounted in the Artesia Hunting Club quarters, together with information about its procurement, and the address of the Secretary of the club at the time the bird was taken. Doctor Lyon states that he is certain that no newspaper publicity was given the incident at the time.

A letter from Mr. Floyd Peacock, Stafford, Kansas, one-time Secretary of the hunting club, states that the bird was one of two individuals which had been seen frequenting Little Salt Marsh Lake, about 25 miles south of Ellinwood, Kansas, for several days prior to the opening of the 1928 duck season. One of the birds disappeared a day or two before the opening of the season, and was seen no more. The

other individual was shot the opening morning of the season, and was identified as a Flamingo by a Federal game warden present at the time. The specimen was sent to a Denver taxidermist, and is now on display at the lodge near the lake.

The sketch and description of coloration supplied by Doctor Lyon leave no doubt as to the bird's identity. The coloration indicates that it is an immature specimen. Doctor Lyon further describes the appearance of the bird in flight, as he saw it before its death, stating that it flew with both neck and legs extended. One is left to wonder what organisms these Flamingos subsisted while in migration and in residence here, apparently so briefly, and what force drove them so far from their normal habitat.—ARTHUR L. GOODRICH, *Department of Zoology, Kansas State College, Manhattan, Kansas.*

Audubon's Caracara in New York.—A caracara (*Polyborus cheriway*) was discovered by John Flavin on September 28, 1946, in Alley Pond Park, a large park on Long Island on the outskirts of the City of New York. During the following week until October 5, 1946, the bird was intermittently noted by other observers, including William O. Astle and John J. Elliott, usually in a large open field. When seen by the writer, on September 29, 1946, the caracara was on the ground, apparently feeding on insects, and on being approached flew to a bare locust tree where it was examined at leisure through 8 × 30 binoculars. On the basis of the description given by Bent (U. S. Nat. Mus., Bull. 170: 131, 1938), this bird was in juvenal plumage, for though it had the characteristic pattern of an adult caracara, the back was brown rather than blackish, the throat pale brown rather than white or buffy, and the chest conspicuously streaked rather than spotted or barred. Whenever the writer attempted to come nearer than about fifty feet the bird would fly off a hundred yards or so and settle on another tree. On one occasion it left its perch to drive off a crow which was sitting on a tree some distance away, and pursued the crow for several minutes until that bird turned around and chased its attacker.

The caracara has never previously been reported from the State of New York and there appear to be very few records away from its breeding range. From the eastern part of the continent Bent (U. S. Nat. Mus., Bull. 170: 135, 1938) lists a bird seen in North Carolina on February 19, 1933, and another found dead on the north shore of Lake Superior in Ontario on July 18, 1892 (which is mentioned also in the A. O. U. Check-List). A caracara was observed in South Carolina in 1943 (Auk, 61: 145, 1944).

Because of the sedentary character of the species, our caracara was carefully examined for any indication of escape from captivity, but none was detected. It appeared vigorous and healthy; it carried no band or jesses; its soft parts were normally colored; its tail feathers were so unfrayed that even the pale tips plainly showed; its wing feathers were intact, except possibly for a secondary on one wing which in flight seemed missing or out of place. While one or two observers report an approach within twenty feet of the caracara before it flew, the writer's own experience with the species in its breeding range suggests that such unsuspiciousness would be perfectly normal behavior. Inquiry established that none of the zoological gardens and menageries in the city had lost a caracara, but the possibility in these cases always exists that the bird may have been brought north by human agency.—EUGENE EISENMANN, *Linnaean Society of New York, New York, N. Y.*

Black Ducks in eastern Montana.—Inasmuch as there appear to be no published records of Black Ducks occurring in Eastern Montana, the following observations on the Bowdoin National Wildlife Refuge, Phillips County, Montana, may be of general interest to ornithologists.

During an outbreak of botulism in July of 1939, many sick ducks were picked up along the lake shore and in the refuge marshes. Among the birds picked up for treatment of botulism at the refuge duck hospital were two Black Ducks (*Anas rubripes* Brewster). The opportunity to examine the specimens in detail left no doubt as to their identity. On September 12 of that year, another Black Duck was brought into the refuge hospital for treatment. The first two Black Ducks recovered and were released; the third duck died.

Black Ducks have been observed quite frequently on the Des Lacs National Wildlife Refuge, Burke and Ward Counties, North Dakota, which is located about 250 miles airline east of the Bowdoin Refuge. Most of the Des Lacs records are of individual birds; however, as many as 19 were seen on June 22, 1939. As yet there has been no evidence of Black Ducks nesting on Des Lacs or the Bowdoin Refuge. The Des Lacs observations indicate that the Black Ducks occur there primarily as irregular fall migrants.—R. E. GRIFFITH, *Division of Wildlife Refuges, Department of the Interior, Chicago 54, Illinois.*

The Northern Lappet-faced Vulture in Palestine—A new record for Asia.—I have deposited in the aviaries of the Zoological Society of London at Regents Park a living specimen of the Northern Lappet-faced or Sociable Vulture (*Torgos tracheliotus nubicus* (synonym, *Otogyys auricularis*)) which has not previously been recorded in Asia to our knowledge. Dr. Vevers, the superintendent, informs me that in the Society's vertebrate list the distribution is given as Egypt to Kordofan, Abyssinia and Somaliland, in Africa. It was caught in February, 1946, in a jackal-trap at Kurnub, between Beersheba and Ein Husb in S. W. Palestine desert country. When first taken to my friend Dr. W. K. Bigger's garden in Jerusalem we thought it was a young Black Vulture (*Aegypius monachus*), a very similar bird which breeds in the area (cf. Hardy, *Handlist of the Birds of Palestine*, Cairo, 1946). I removed it to my office in Allenby Barracks in Jerusalem and kept it for a fortnight in a very large room where P. A. D. Hollom and other ornithologists of the Jerusalem Naturalists' Club saw it. Dr. H. Mendelssohn first suggested the bird was *Torgos*, and comparison with immature Black Vultures in his aviaries at the Biological Institute in Tel Aviv showed it to be a lighter bird, and when later I had it crated and flown to the London Zoo where more reference literature was available, its identity was confirmed.

The following is a summary of descriptions I made for the Bulletin of the Jerusalem Naturalists' Club: wing, 790/830 mm.; tarsus, 130/150; bill from cere, 72. General plumage brown; head and neck nearly naked with bluish-gray to dull reddish-violet skin; bill blackish-horn with a dark ridge on the culmen; cere slaty gray; iris dark brown; nostrils oval, perpendicular; only a little down on head and neck; long black bristle hairs on chin and eyelid; soft brown feathers on throat; feathers of under parts a thick white down; on sides of neck soft gray feathers; on lower neck a frill of lanceolate brown feathers with paler margins, which extended down the center of the breast. Legs and feet blue-gray; claws black. The large, cinereous-brown feathers of its back and shoulders were prominently outlined. A very short, pale brown ruff of feathers was raised forwards or erected on the nape of the neck. Primaries and rectrices were a darker brown. Under the wing and on the flanks it showed much white in flight.

A mounted specimen at present possessed by Machial Bahow, of the Arab National Bus Co., and in his house at Upper Baq'a, Jerusalem, was shot by Dr. G. Ridenko (a 'hunter' of Jaffa) near Neby Musa monastery in the desert near the N. W. shore of the Dead Sea. I have discussed this specimen with both these men, and with my

friend Dr. W. Moses of the Palestine Ornithologists' Union whose taxidermist mounted it, and it was shot early in the war. However, it appears that in the winter of 1934-1935 an Arab hunter shot what was seen to be probably this species in the same area, but would not surrender the specimen. In 1945, Dr. Mendelssohn told me, he found a nest in the Dead Sea area in January, with a bird sitting.

It is most likely that *Torgos* has inhabited the Dead Sea/Arabah depression as a rare resident for some considerable time, but has been confused with the somewhat similar but darker *Aegyptius monachus*, although we now know the whitish underwing and flanks as field characteristics. This determination of yet another tropical African species in the Syro-African/Rift Valley links up with several more tropical species, not only of birds, but of reptiles, insects, and plants established in the Jordan-Dead Sea rift. In an ecological study of the fauna and flora of this area, made in several expeditions of the Middle East Biological Scheme during the past two years, which I am publishing shortly in America in joint authorship with Claude T. Barnes, the American zoologist of Salt Lake City, who first suggested the idea, there is described the breeding of another apparently previously unrecorded African bird in the S. W. Dead Sea cliffs at Jebel Asdum—the Sooty Falcon (*Falco concolor*), with specimens from so far north as Bethlehem and Mt. Scopus/Jerusalem. When I first began field studies here for the Middle East Biological Scheme I suspected that the several African birds breeding in the Dead Sea depression—the Palestine Sunbird (*Cinnyris osea*, Bonaparte), the Small Fan-tailed Raven (*Corvus rhipidurus*, Hartert), etc.—had originated as an immigration into Asia from Africa via the Red Sea-Aqaba-Wadi Arabah-Dead Sea route into the subtropical Rift Valley, but subsequent studies in coöperation with Palestine botanists and zoologists at several 'pockets' or enclaves of typically tropical fauna and flora that occur in the area altered my theory to a view that they are survivals of a tropical fauna and flora formerly covering a larger area.—(Capt.) ERIC HARDY, 47 Woodsorrel Road, Liverpool 15, England.

Barn Owl breeding near Chicago, Illinois.—On several occasions in June and July, 1946, I (and others) watched Barn Owls (*Tyto alba pratincola*) and their young at their nest about thirty feet from the ground in the hollow top of a broken oak in the yard of the home of Mr. and Mrs. Harry J. Dunbaugh, Winnetka, Illinois. This is in a residential part of the village, a few hundred years from Lake Michigan. Ford, Sanborn, and Coursen, 'Birds of the Chicago Area,' 1934, report the Barn Owl as "A rare resident. There are three published breeding records." Since 1934 there has been one additional record, made in 1936 and published by E. K. Hammond (Auk, 60: 599, 1943).—WALTER T. FISHER, Chicago, Illinois.

Barn Swallow nesting in Florida.—A nest containing two eggs and two newly hatched young of the Barn Swallow (*Hirundo rustica* subsp.) was found on June 23, 1946, about twelve miles southwest of Pensacola, Florida, at a point almost on the Gulf beach. On June 30, the two eggs were found to have hatched and the four young swallows were being fed regularly by both parents. As far as can be determined, this is the only nesting of this species ever recorded from Florida.

The nest was plastered against the side of a roof beam of a tiny, reinforced concrete building in the Army reservation on the west side of the entrance of Pensacola Bay. It was about nine feet above the floor, and its upper edge was only two inches below the ceiling. An open doorway allowed easy access to the parent birds. The nest had evidently been built in two distinct stages, for the lower half was of black mud and the upper half of red clay from a near-by road. Since it is a well-known habit of this species to add to an old nest in successive seasons, the first stage of the present nest may well have dated from the 1945 nesting season.

Of the two races of the Barn Swallow known to occur in this central Gulf Coast region, the northern form (*H. r. erythrogaster*) is an abundant spring and fall migrant, and is present (at Pensacola) from early April until late in May and from early August until the last of October. Its nearest known nesting point is in extreme northwestern Alabama, 300 miles north of the Gulf Coast. The other race is the comparatively rare Gulf Coast Barn Swallow (*H. r. insularis*), a pale-breasted form discovered and described by T. D. Burleigh (Occ. Papers, Mus. Zool., Louisiana State Univ., 11: 179-183, 1942), who found it nesting on the islands along the Mississippi coast. Burleigh noted this form only along the actual Gulf beaches, and reported that he had never seen it inland, whereas the abundant northern form covers the whole region during its sojourn. In spring, when the northern birds are in fresh, bright plumage, the pale-breasted Gulf Coast birds can be identified in the field with ease and certainty; though, when the northern birds return in August accompanied by many pale-breasted young-of-the-year, the separation of the two forms in the field is no longer possible.

Prior to the publication of Burleigh's description of the Gulf Coast form, I had several times seen Barn Swallows along the Gulf beaches near Pensacola in June and July, but I had missed the significance of the paleness of the under parts of these birds and had considered them to be mere stragglers of the northern form. Dates of these occurrences, taken from my journal, are: July 4, 1925 (1 bird); June 21, 1931 (1); July 16, 1933 (1); June 23, 1940 (2); and July 19, 1942 (2). These birds were, I now believe, representatives of *H. r. insularis*. The parent birds at the nest recorded in the present note were seen to be pale-breasted, noticeably paler than the brightly colored birds that had passed through this region a month earlier. The presence of these birds on an Army reservation precluded the shooting of specimens for subspecific identification, but it seems not unreasonable to call them *insularis* rather than *erythrogaster*, and to ascribe this first nesting to be recorded from Florida to the near-by Gulf Coast Barn Swallow and not to the distant northern form.

After Burleigh had discovered the Gulf Coast form but before he had published his description of it, he had found a thriving nesting colony at Fort Morgan, Alabama (Auk, 58: 261-262, 1941), thus extending the known breeding range 57 miles eastward from the point of discovery. The present note extends the known range another 43 miles eastward, to a point in Florida 14 miles east of the Alabama state line.—FRANCIS M. WESTON, 2006 E. Jordan St., Pensacola, Florida.

The Red Phalarope in Florida.—On October 29, 1946, the junior author found a fresh specimen of the Red Phalarope (*Phalaropus fulicarius*) on the three-mile bridge that spans Pensacola Bay, Florida. The bird had apparently been killed in flight by striking some overhead electric power cables and had fallen into the roadway. The specimen is now Number 134 in the collection of Miss L. E. Pate, of Pensacola.

On December 23, 1938, a living bird of this species was found in a dazed condition (as from a collision in flight) at the Naval Air Station, Pensacola, Florida, and was brought to the senior author for identification. The bird later recovered its powers of flight and was released.

Howell (Florida Bird Life, 1932) records but two specimens of this phalarope from Florida. As well as can be determined by the authors from available data, the specimen recorded herein is only the third from the state.—FRANCIS M. WESTON, 2006 E. Jordan St., Pensacola, and MALETA M. (MRS. J. F.) WERNICKE, Gull Point, Florida.

Ring-necked Duck breeding in Ontario.—Recent numbers of 'The Auk' have carried short notes and full-length articles on the increase in breeding range of the Ring-necked Duck (*Aythya collaris*). This spread was apparent to the writer as early as 1939, at least, and while notes on this increase in range were forwarded to Ontario authorities, no published comment has, as yet, been forthcoming.

The writer has summered in the Huntsville-Lake of Bays region of Ontario for many years, particularly at Rebecca Lake, about fourteen miles northeast of Huntsville. This lake is in the northeast corner of the District of Muskoka, a few miles from the surrounding districts of Parry Sound, Nipissing, and Haliburton. About one-quarter of a mile south of Rebecca Lake is a small, somewhat marshy lake, known as Mansell's Lake, which has certain attractions to waterfowl. Unfortunately, while access to this lake is to a point of good vantage, ducks, as a rule, keep to the far shore, only occasionally permitting positive identification.

Thus, while ducks have been seen there since 1933, when the writer commenced note-keeping, it was not until 1939 that positive identification of the Ring-necked Duck was made. On August 6 of that year, a female and nine striped young were seen. An additional four, apparently full-grown, were on the lake but farther away. The young agreed in appearance with the plates of the Ring-necked Duck in T. M. Shortt's 'The Ducks, Geese and Swans of North America,' while the ducks in the distance were seen to dive. On August 10, the larger ducks were found close to shore and were "Scaupy" in appearance, the speculum appearing to be that of a Ring-neck. From their proportions and manner of swimming and diving, it was deduced that these were also Ring-necks and birds of the year.

On August 31, 1941, five apparently full-grown ducks were again found on Mansell's Lake. Their appearance and actions were the same as those seen in 1939. When one bird swam by, a vague light mark was seen at the side of the breast, the apparently not fully developed breast-mark of the Ring-neck. These were again apparently birds of the year.

In 1944, on July 5, the writer and Mrs. Millicent M. Mansell saw a female and eight downy young there. These young were diving, and had the same markings as those seen in 1939. On July 7, a canoe was introduced into the lake with some difficulty, and two females, each with seven young, were seen; and close by was a full-plumaged drake. All birds were seen up to July 14, and presumably five of them were seen on September 4.

The presence of a drake was the 'clincher,' and removed all doubt from the writer's mind as to the specific identity of the ducks seen since 1939. It was also possible, with the canoe, to approach the females and their broods much more closely than heretofore, and satisfactorily establish their identity. Collecting is not permitted in this vicinity, unfortunately, and the writer was anxious to clear up the matter of identity, which, for a number of years, had been held in abeyance pending separation in the field of this and *N. affinis*.

On July 12, 1946, a female and seven young were again seen on Mansell's Lake, from which they seemed to be absent in 1945, although it would have been possible for them to remain unobserved at the far end of the lake among the lily-pads. This is a considerable extension of the breeding range of the species in Ontario.—WM. C. MANSELL, 7 Sunny Lea Ave., Toronto 9, Ontario.

RECENT LITERATURE

A Connecticut garden.¹—This is the story of a garden planted by Dr. Alsop and a friend who felt the urge to own a country place and purchased an old house in Connecticut, with its surrounding acres, for a week-end home. Here they experimented with gardening, sometimes according to the rules but as frequently according to impulse. The failures and successes are alike recounted in the month-by-month log, from April to November.

It is not, however, a formal garden calendar, nor yet a continuous narrative, but is rather a series of essays in which the progress of the garden takes its place, bringing in personal experiences in other times and places and discussing nature in general or certain of its aspects in particular. Since birds frequent gardens, they are accorded occasional mention, but it is the garden itself which is the undoubted center of interest and the birds are of secondary importance. The book will be read, therefore, not for its ornithological information but rather for its literary flavor.—J. T. ZIMMER.

Bent's 'Life Histories.'²—Mr. Bent's progress in this monumental work is a matter for sincere congratulation. When one marks the extent of the source material from which the accounts of the various species have been drawn, the mere work of assembling the data assumes gigantic proportions. In this work, as in the writing of a few of the biographies and other details, assistance is acknowledged as in past numbers, but putting this extensive material together into its final shape can have been no easy task.

There is no need to comment on this number, the fifteenth in the series, beyond making the statement that it follows the excellent pattern of its predecessors, giving the life histories of the jays, crows, and titmice as far as they are recorded in literature or known to the author and his contributors. It has become a commonplace, when some question arises concerning the nesting or other behavior of a North American bird to say: "What does Bent say about it?" The chances are that he will have something bearing on the problem.

In the present bulletin, Winsor M. Tyler, Jean M. Linsdale, B. W. Tucker, Edward von S. Dingle, Alfred O. Gross, and Alexander Sprunt, Jr. have contributed one or two life histories, each, and 42 new contributors of notes are added to the list of nearly 500 individuals who have coöperated in furnishing pertinent data for the preceding numbers. As Mr. Bent remarks in his introduction, if an observer knows something about one of our birds that fails to find a place in these volumes, it is his own fault for not sending the information to the author. The amount of data that Mr. Bent has uncovered and published makes this series a work of extreme utility and one of which American ornithology can well be proud.—J. T. ZIMMER.

Spring in Washington.³—Spring undoubtedly means different things to different people. To many dwellers in large cities, even those places with extensive parks or easily accessible countryside, it carries but little comprehension of the rapidly changing face of nature. If their attention be called to some outstanding feature of the procession, such as the blossoming of the cherry trees around the Tidal Basin in Washington, they become aware of it and may even grow to look forward to its

¹ ALSOP, GULIELMA F. 'April in the Branches.' 8vo, pp. 1-257, decorations (by John Shays), April 1, 1947. E. P. Dutton & Co., New York. \$3.50.

² BENT, ARTHUR CLEVELAND. 'Life Histories of North American Jays, Crows, and Titmice.' U. S. Nat. Mus., Bull. 191, pp. XI + 495, pls. 1-68, 1946.

³ HALLE, LOUIS J., JR. 'Spring in Washington.' 8vo, pp. 1-227, 47 figs. + jacket illustr., end-paper map, April 24, 1947. William Sloane Associates, Inc., New York. \$3.75.

repetition, but of the vast and equally significant, though less obvious, periodicity, they remain ignorant or indifferent.

Mr. Halle is not among the unobservant ones. He is, on the contrary, keenly aware of the first premonitory signs of awakening spring in the song of the Cardinal in January, of the Carolina Wren in February, and of the first Robin in March. To him, moreover, these are not simple milestones in the progress of the seasons but equally important as cornerstones on which to build a philosophy of life and mark man's advancement in his responses to nature through the ages.

Some of all of this he has given us in the pages of his newest book. Primarily it concerns his rambles around Washington and its environs and his observations there of birds and their ways, but it is filled with commentaries and speculations that often carry the reader a long way from the nation's capital. This is a book that may be read at a sitting or in fragments and to which the reader will wish to return for browsing or to re-read some passage that caught his eye at first perusal. Those who love nature will find many such passages. Perhaps those to whom nature is less familiar will find here an incentive to look about them. Even in a city they have not far to look as the author amply demonstrates.

The illustrations by Lee Jaques are as satisfying as the text and carry the feeling of the woods and fields even against the background of man-made structures that, in a city, are never far away.—J. T. ZIMMER.

Panantarctic ornithology.—This exceedingly useful paper is described as the first comprehensive Norwegian report on antarctic birds. Based mainly upon material obtained by Olstad during the cruises of the *Norvegia* between 1927 and 1930, it includes also published accounts of specimens collected by at least a dozen Norse explorers. Among these are birds brought back by Amundsen after his South Pole Expedition of 1910-1911 and others dating from the voyages of Captain C. A. Larsen in the early years of the present century. Particularly important items are the *Norvegia* specimens from such previously unworked stations as Bouvet and Peter I Island, the collections of Ring from the Crozets and Kerguelen, and those of Lars Christensen from Gough Island. As will be seen from this summary, the area encompassed extends outward across the subantarctic zone to the edge of the subtropics, but nearly all representatives of the sea bird fauna are species with antarctic affinities.

The systematic part of Dr. Holgersen's paper is based directly upon specimens and therefore does not cover certain species, such as *Diomedes chlororhynchos*, which were apparently not available in the collections studied at the University Museum in Oslo. The birds thus omitted are, however, listed in the second section of the paper, which comprises a faunistic analysis of the Antarctic Mainland, Peter I Island, the Graham Land area, the South Shetlands, South Orkneys, South Sandwich group, South Georgia, Bouvet, Marion and Prince Edward Islands, the Crozets, Kerguelen, Heard, Macquarie and Gough. In no other single publication is it possible to find such a simple and practical compendium of the birds of the entire panantarctic area.

Most notable among Holgersen's zoogeographic data are those which confirm and extend the relatively high antarctic status of Bouvet Island, in the South Atlantic. Bouvet is in the approximate latitude of South Georgia but, lying well to the east, it is affected by great masses of ice carried out of Weddell Sea into the west-wind belt. Consequently, it proves to be the northernmost breeding station of the Adélie

¹ HOLGERSEN, HOLGER. 'Antarctic and Sub-Antarctic Birds. Scientific results of the Norwegian Antarctic Expeditions 1927-1928 et seq., instituted and financed by Consul Lars Christensen.—No. 23.' Norsk Videnskaps-Akad. Oslo, 100 pages, 23 text figs., 1945.

Penguin as well as of the Ringed Penguin. Another penguin (*Eudyptes chrysolophus*) and such high-latitude petrels as *Daption*, *Priocella*, and "probably *Pagodroma*" also nest there. The scarcity or absence of soil at Bouvet limits the breeding petrels to cleft-dwellers rather than burrowers.

Holgersen's notes on the Gentoo Penguin (*Pygoscelis papua*) call attention to variations of possible taxonomic and geographical significance. His conclusions, as well as those of earlier writers, are confused, however, because of the fact that a very strongly marked racial distinction between the subantarctic and the truly antarctic representatives of this species has not yet been recognized. In order that this source of misunderstanding may be eliminated, the antarctic race of *Pygoscelis papua* is described on page 454 of this issue of *The Auk*.—R. C. MURPHY.

Distribution and migration of terns.¹—This paper is a careful and exhaustive study of the widely distributed yet closely related group of terns of the genus *Sterna*, comprising the species *hirundo*, *macrura* (= *paradisaea*), *hirundinacea*, and *vittata*. These include two relatively sedentary terns of the southern hemisphere and two migratory terns of the northern hemisphere. One of the latter is believed to perform the longest migration among birds, since certain individuals probably nest north of the Arctic Circle and winter south of the Antarctic Circle.

Kullenberg's approach is gratifyingly ecological, taking full advantage not only of ornithological literature but also of correlative data from whaling and fisheries investigations and from the oceanographic findings of the *Dana*, *Meleor* and other recent expeditions. Titles of more than 70 consulted publications reflect the new breadth of source material required in a consideration of marine birds. Unfortunately, the war seems to have deprived the Swedish author of access to several papers important to his researches. Among these are Falla's masterful volume on the B. A. N. Z. Antarctic Research Expedition (Reports, Series B, II, Birds, 288 pages, Adelaide, 1937), and Murphy's revision of Pan-Antarctic terns (*Amer. Mus. Novit.*, No. 977, 17 pages, 1938). The latter corrects certain untenable conclusions in the same author's 'Oceanic Birds of South America.'

Still another, and more recent, report which he would have found applicable is Palmer's behavior study of the common tern (*Proc. Boston Soc. Nat. Hist.*, 42: 1-119, 1941), in which ecological or "adaptive" distinctions between the species *hirundo*, *dougalli* and *paradisaea* are pointed out with singular clarity.

Kullenberg offers highly reasonable and suggestive, even though partly speculative, opinions to explain the kinship and present distribution of the terns under consideration, taking account of climatic changes since the latter Tertiary and keeping his theories well anchored to fundamental requirements of food supply along migration routes and of the increased hours of daylight in higher latitudes. His ecological comparison of the Arctic and Common Terns is original and convincing, matching well the heritage-habitus relationship exhibited by many other "paired species" of organisms.—R. C. MURPHY.

Attracting birds to the garden.²—This book, first published in 1939 by Reynal & Hitchcock, has been out of print for some time and is now reissued under the aegis of the University of Minnesota Press. It shows no textual or other changes other than in the rearrangement of the introductory matter, the addition of a list of the illustrations, and a different grouping of the plates. The paper is thinner but of excellent quality and the book is consequently lighter and thinner, which is an advantage.

¹ KULLENBERG, BERTIL. 'Über Verbreitung und Wanderungen von vier *Sterna*-Arten.' *Arkiv för Zoologi*, Band 38A, No. 17, pp. 1-80, 19 text figures, Stockholm, 1946.

² MCKENNY, MARGARET. 'Birds in the garden and how to attract them.' Superroyal 8vo, 16 pr. pp., pp. 1-349, 48 pls. (16 col.), pls. I-V, Sept. 14, 1946. University of Minnesota Press. \$5.00.

Since the original edition escaped review in *The Auk*, it may be well to state that this is a very useful work for those who wish to encourage birds to visit their gardens. There are discussions of the value of birds to the gardener, the construction of bird boxes, the care of stray birds, food and cover, with a long list of plants and the birds that feed on each of them, and other similar topics of interest and value. With this book as a guide, the householder with a little garden space should be able to make the most of his opportunities to have at least some attractive birds about him.

The colored plates, taken from Roberts's 'Birds of Minnesota' or 'Bird Portraits in Color' add greatly to the attractiveness of the volume and are augmented by numerous photographs and a number of diagrams.—J. T. ZIMMER.

Index to Strong's 'Bibliography.'¹—The present long-awaited volume makes considerably more accessible the extensive list of references contained in the two preceding parts (*cf.* Auk, 57: 264–265, 1940). One hundred and nineteen general headings have been selected, most of which are broken up into a succession of sub-headings, culminating in small groups of references to the same limited topic, cited by author and year. The list of general headings is given in the table of contents, but since these are arranged alphabetically in the volume, it is easy to find them without reference to the table; the subheadings under each are not so easy to find without running over the pages.

Admittedly not all the topics covered by the first two volumes are included in this index although presumably all the titles are so embraced (by author and date). The scheme of classification is not entirely consistent, as the author admits. In any case, in a work of this kind there is always some question as to the best classification of certain papers, especially when they are broad in nature, and in some cases articles dealing with the same subject will be found under different headings. Extensive, but incomplete, cross-referencing has overcome some of this difficulty. It is doubtful if it could be completely remedied within the space allotted which is but little over half the space given to the original references. Anyone who has undertaken cross-referencing extensive literature will appreciate the problem.

In spite of this difficulty, there is a vast amount of bibliographic information laid bare by this index. There is mention in the preface of a 'Finding Index' from which it would appear that there is to be a fourth part with the subheadings and headings also indexed. This should overcome much of the difficulty that still remains with the appearance of this third part.

The literature on ornithology today is so vast, even excluding most taxonomic papers as Dr. Strong, perforce, has done, that some selectivity was required. In the preface to the first volume, Dr. Strong explained the basis for some of the selection which excluded many minor articles and some major ones. When one considers that about 2000 different periodicals, aside from books, are cited in the bibliography, the extent of the author's labors becomes obvious, especially since many of these publications were not immediately accessible to him. A researcher on any topic, therefore, is quite certain to find that he knows of certain papers that have not been included. What Dr. Strong has done, however, is to give a more than ordinarily extensive survey of the whole subject. In some of the articles cited under the various headings, the worker will find special bibliographies which will supplement those given in the present work. Here he not only is shown where to begin walking, but is carried a long way down the road.—J. T. ZIMMER.

¹ STRONG, REUBEN MYRON. 'A bibliography of birds, Part 3. Subject Index.' *Field Mus. Nat. Hist., Zool. Ser.*, 25 (3): 1–528, 1946. \$4.50.

Massachusetts birds.¹—This recently received work is more than a list of species for the county. Each species or subspecies of bird or mammal is given a line or two of brief description, its status as resident or visitant and its comparative rarity are stated, and a paragraph of discussion is added regarding its habitat, behavior, song, or other characteristic including, if it is rare, the pertinent records of its local occurrence. The topography, faunal position, and ornithological and mammalogical history of the county are treated in preliminary sections. The catalog of bird skins and eggs list the specimens preserved in eight institutions and private collections. A bibliography follows.

This is a good foundation for future distributional work in Worcester County. Species likely to occur or to breed in the county are pointed out as are numerous forms commonly accepted as occurring but of which there are no authentic specimens. Local ornithologists thus have a guide to the points needing further clarification.—
J. T. ZIMMER.

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CORRESPONDENCE

SMYTHIES'S 'BIRDS OF BURMA'

EDITOR, THE AUK.—Regarding Smythies's 'Birds of Burma,' on the status of which Mr. S. Dillon Ripley gave interesting information in the last issue of The Auk (63: 631, 1946), I would add the following. I received notice of this publication from the American Baptist Mission Press some time in 1941, and immediately ordered a copy. Before I thought my order had time to reach Rangoon, Burma had been overrun by the Japanese, and I expected that I would never hear anything further. Imagine my delighted surprise when, about two months after the fall of Rangoon, I received 'Birds of Burma' through the mail. The volume is now in my personal library.—B. W. CARTWRIGHT, *Chief Naturalist, Ducks Unlimited, Winnipeg, Manitoba.*

VERNACULAR NAMES OF BIRDS

EDITOR OF THE AUK.—The problem of the correct vernacular names of birds is arousing general interest at the moment (see for instance the note by Eisenmann and Poor, 1946). In addition to the general problem which they discuss, it would seem desirable to achieve as much uniformity as possible between British and American "English names," as an increasing number of people are studying birds on both sides of the Atlantic. We suggest the following principles as a basis for discussion.

A. GENERAL PRINCIPLES

1. English names should not be regarded as rigidly fixed. The English language is always in process of slow change, and this seems a desirable state of affairs. Further, popular usage must be the ultimate criterion, and the deliberate creation of new names which have no popular support should be reduced to a minimum. However, we suggest that periodic bird lists should be published, to help to stabilize names, in the same way that English dictionaries have been issued in the past for the language as a whole. Obviously, rules of priority have no validity with regard to English names.

2. We agree with Eisenmann and Poor that every species should have a comprehensive name used for all races of that species, and which can be applied to any individual without identifying it as to race. This will necessarily involve the deliberate creation of some new names, but these should be as few as possible.

3. We suggest that English names for subspecies should in general be abandoned, because (a) the addition of an English subspecific name in front of the specific name often makes the whole name extremely long and clumsy; (b) most subspecies cannot be identified in the field; (c) they give the amateur a misleadingly definite idea of the subspecies concept; (d) the use of the scientific (Latin) name of the subspecies is sufficient in itself and is without ambiguity. Should an English name be necessary for any purpose, the specific name could be preceded or followed by the breeding area of the race in question, but this practice should be reduced to a minimum.

However, it may be desirable to retain separate subspecific names for extremely distinct subspecies, particularly where this name came into existence before the subspecies concept, e. g. popular usage will probably make for the retention of Pied Wagtail and White Wagtail (*Motacilla alba yarrellii* and *Motacilla alba alba*) in western Europe, as these very distinctive forms already had English names before they were treated as races of the same species. There are also cases in which it is doubtful whether two forms should be considered as separate species or as subspecies of the same species; e. g. Carrion and Hooded Crows (*Corvus corone* and *Corvus cornix*).

4. Brevity is desirable.

5. It is a mistake to be too logical. Names sanctioned by long and frequent usage should in general be retained, even if they are somewhat inappropriate.

6. Specific names which refer to a region or a person, or which include the term "common," are less satisfactory than descriptive names, so should be avoided where a satisfactory alternative is available.

7. A qualifying adjective to the group name is not essential. E. g. in England the use of the name "Whitethroat" for *Sylvia communis* causes no confusion, even though there is also a Lesser Whitethroat (*S. curruca*). The terms "Common Whitethroat" and "Greater Whitethroat" have quietly dropped out of use. The same applies to many other cases.

B. BRITISH AND AMERICAN NAMES

1. Where the same species (whether or not it is of the same subspecies) bears a different vernacular name in Britain and North America, uniformity should be obtained by one of the following methods.

(a) Where a species is regular on one side of the Atlantic, but only a vagrant on the other, it should take the name in use where it is regular; e. g. Baldpate not American Wigeon for *Anas americana*.

(b) Where a species is regular on both sides of the Atlantic, but the name on one side is considered by both British and American ornithologists to be very inferior to the other name, only the one name should be used; e. g. *Podiceps auritus* could well become Horned Grebe, Slavonian Grebe being suppressed, and *P. griseigena* could well become Red-necked Grebe, Holboell's Grebe being suppressed.

(c) Where a species is regular on both sides of the Atlantic, and the name on one side is a name formerly in regular use on the other, this name might be adopted on both sides, but, temporarily, it would probably be desirable to retain the other name in brackets; e. g. *Podiceps nigricollis* might become Eared (Black-necked) Grebe, and *Mergus merganser* might become Goosander (American Merganser).

(d) Where the species is regular on both sides of the Atlantic, and is usually known by a good but different name on each side, either of which it is undesirable to change, both names should be retained. In an American list the American name should be put first, in an English list the English name; e. g. in an American list "Chickadee or Willow Tit," for *Parus atricapillus*, in a British list "Great Northern Diver or Loon" for *Colymbus immer*.

N. B. We suggest that procedure (d) should be adopted in every case where a joint English and American committee feel that there is any good reason to retain both names. This is in accordance with the policy announced at the beginning of this note, that the English language cannot be forced, though it evolves. We do not think there is anything to be gained by suppressing any of the well-known names on either side of the Atlantic at the present time. However, we think it quite likely that, confronted by two vernacular names, one of which is much simpler than the other, popular usage will tend more and more to the use of the simpler one, and that the other will gradually be dropped, e. g. we think it quite possible that Arctic Skua may come to replace Parasitic Jaeger for *Stercorarius parasiticus*. However, we feel that such verdicts should in most cases be left to popular usage to decide.

2. Where a different species bears the same name on either side of the Atlantic, both species should continue to bear this name, but where there is any doubt as to which is intended, the prefix "American" or "European" should be added; e. g. *Turdus migratorius* is the American Robin, and *Erithacus rubecula* is the European

Robin. It is in our view undesirable to attempt to change most of the names which come under this head, as their usage is so long established. However, a possible exception might be made in the interests of general clarity in cases where the name on one side of the Atlantic is misleading from the point of view of general relationships within a group; e. g. would it conflict too much with American popular opinion to drop the term "buzzard" for a vulture, to restrict the term "hawk" to accipitrine birds, and to use the term "falcon" (not hawk) for members of the genus *Falco*?

To conclude, these points are intended for discussion, and we would suggest that a joint committee of British and American ornithologists be formed to decide on the points raised.—B. W. TUCKER: DAVID LACK; *University of Oxford, England.*

NOTES AND NEWS

NOTICE

THE SIXTY-FIFTH ANNUAL MEETING

AS ANNOUNCED in *The Auk* for January, 1947, with corrections in the April issue, the Sixty-fifth Stated Meeting of the American Ornithologists Union will be held in Toronto this year with general sessions at the Royal Ontario Museum on September 9, 10 and 11. Business meetings of Council, Fellows and Members will be held at the headquarters hotel, the Royal York, on September 8. A field day has been planned for September 12. More details will be announced in the Committees Circular of information which will reach all members before the meeting. Please make your hotel reservations early.

The Secretary advises that titles of papers intended for presentation at this meeting *must* be in his hands not later than August 9 in order to be included in the printed program. Titles should be accompanied by brief abstracts of the contents of the papers and statements concerning the time needed for delivery and the kind of projection facilities needed, if any.

THE AUK is saddened to announce the death of P. A. Taverner, Fellow, at Ottawa on May 9, 1947.

As we go to press, word has come of the death of Wilfred H. Osgood, Fellow, at Chicago on June 21.

OBITUARIES

ARTHUR FRANCIS BASSET HULL, a Corresponding Fellow of the American Ornithologists' Union, elected in 1919, died at Manly, Sydney, Australia, September 22, 1945, at the age of 83. He was born October 10, 1862, in Tasmania where he received his early education. After graduating in law, he joined the New South Wales Civil Service in 1892. Ten years later he visited Europe to study methods of dealing with problems of the unemployed. Returning in 1903, he joined the New South Wales Department of Mines where he was in charge of legal matters for 18 years.

Hull took an active part in the work of the Royal Zoological Society and the Linnean Society of New South Wales. He served three terms as President, and many years as Honorary Secretary and Editor of the Zoological Society, and as President of the Linnean Society in 1923-24. He was also a member of the Taronga Zoological Park Trust for 16 years and was on the honorary ornithological staff of the Australian Museum and a Corresponding Member of the Academy of Natural Sciences of Philadelphia. His published contributions to ornithology appeared mainly in 'The Emu,' the 'Proceedings of the Linnean Society,' and the 'Australian Zoologist.'

In addition to his activity in ornithology, he was also interested in conchology and in 1927 was co-author with Tom Iredale of 'A Monograph of the Australian Loricates.' He was also a philatelist of wide reputation and published on the stamps of New South Wales, Queensland, and Tasmania.—T. S. PALMER.

JOHN FLETCHER STREET, a Member and Treasurer of the American Ornithologists' Union, died at Jeanes Hospital, Philadelphia, Pennsylvania, September 18, 1944, at the age of sixty-four. He was born in Beverly, New Jersey, June 11, 1880, and continued to live there all his life, although he maintained his office as a landscape architect in Philadelphia.

Street was elected an Associate of the Union in 1908, a Member in 1928, and Treasurer in 1942. He was the first officer in the history of the Union to die during his term of office. He was also an active and prominent member and former President of the Delaware Valley Ornithological Club. Popular, energetic, with a faculty of making and keeping friends, Street, next to Witmer Stone, probably did as much as anyone toward building up the Club and stimulating the interest of its members. He was essentially a field observer and took infinite delight in organizing field trips, especially to the Pine Barrens of New Jersey, a region which he knew intimately both botanically and ornithologically. He was a good botanist and knew where to find the rare plants and when to find them in bloom. He was not a voluminous writer but contributed occasional notes to 'The Auk' and 'Cassinia.' He published a popular book entitled 'Brief Bird Biographies,' illustrated by his own pen and ink sketches, which had a considerable circulation at the time of its appearance.—T. S. PALMER.

GEORGE HAY STUART, 3RD, a Member of the American Ornithologists' Union, died in Philadelphia, Pennsylvania, July 10, 1944, at the age of seventy-two. He was born in Boston, Massachusetts, October 12, 1872. Shortly after graduating from the Germantown Academy in Philadelphia, he entered the employ of the Girard Trust Company and began a business association that continued for more than fifty years. At the time of his retirement in 1942, he was Vice-President and in charge of the banking department of the company.

Stuart was elected as Associate of the Union in 1913, a Member in 1928, and served for a number of years as Chairman of the Investment Trustees. He was also an active and prominent member of the Delaware Valley Ornithological Club. His

interest was mainly in the field of oölogy, and he brought together a carefully prepared collection of birds' nests and eggs, for the most part collected and identified by himself. He made expeditions to distant parts of the United States and Canada in search of specimens, and his annual vacation trips were planned with a view to collecting eggs under the most advantageous conditions. His collection is now in the Museum of the Academy of Natural Sciences of Philadelphia. Stuart was not a voluminous writer, but he contributed occasional notes to 'The Auk' and 'Cassinia.' After his retirement, he prepared brief biographical sketches of some of his former associates, including Edward Norris and William Henry Trotter, which appeared in 'The Auk' for 1943.—T. S. PALMER.

CLINTON GILBERT ABBOTT, a Member of the American Ornithologists' Union, died in San Diego, California, March 5, 1946, in his sixty-fifth year. He was born April 17, 1881, in Liverpool, England, the son of American parents, Lewis Lowe and Grace Van Dusen Abbott. He graduated from Columbia University in 1903 and, from 1918 to 1921, served as Secretary and Editor of the New York State Conservation Commission. In 1921, he took charge of Public Education in the Natural History Museum in San Diego and the following year was appointed Director of the Museum, a position which he held until his death.

Abbott was elected an Associate of the Union in 1898 and a Member in 1931. He was also a member of the Cooper Ornithological Club, the American Society of Mammalogists, the Linnaean Society of New York (Vice-President 1911-1914), National Audubon Society, International Committee for Wildlife Protection, and Western Society of Naturalists, and was a fellow of the San Diego Society of Natural History and President from 1923 to 1925. He was particularly interested in life histories of birds and was the author of 'The Home Life of the Osprey,' 1911, and a contributor to 'The Auk,' 'Condor,' and other scientific journals. He is survived by his wife, the former Dorothy Clarke, and three daughters, Mrs. Hal G. Evarts, Jr., Mrs. Peter D. Whitney, and Lucia Grace Abbott.—T. S. PALMER.

VERNON ORLANDO BAILEY, a Member of the American Ornithologists' Union, died in Washington, D. C., April 20, 1944, in his seventy-eighth year. He was born in Manchester, Michigan, June 21, 1864, and at an early age moved with his parents to Elk River, Minnesota, which became his home for a number of years. His early education was received in the public schools of Minnesota, but he took special work at the University of Michigan in 1893 and at George Washington University, D. C., in 1894 and 1895. He began collecting for the Department of Agriculture in 1887 and continued the work for forty-six years until his retirement as Chief Field Naturalist of the Biological Survey.

Bailey was a keen observer and an expert in trapping mammals. His chief interest lay in studying the life history and distribution of mammals, but he published biological surveys of Texas, New Mexico, and North Dakota, and a number of technical papers on certain groups of rodents, including *Microtus*, *Evotomys*, and *Thomomys*. Among his distributional papers were those on the mammals of the District of Columbia, Glacier National Park, and Mammoth Cave, Kentucky. One of his latest contributions was the Memorial of A. W. Anthony which appeared in 'The Auk' for 1941. He was also much interested in the Boy Scouts and, as a Scout Master, delighted in taking his troop out camping and teaching the members practical woodcraft.

He was elected an Associate of the A. O. U. in 1887 and a Member in 1901. He was also a member of the Cooper Ornithological Club, the American Society of Mam-

malogists (President), the American Association for the Advancement of Science, the Washington Academy of Science, and the Biological Society of Washington of which he was President in 1922. At the time of his death, he was serving as President of the Audubon Society of the District of Columbia. He is survived by his wife, Florence Merriam Bailey, whom he married in 1904.—T. S. PALMER.

EDWARD ALPHONSO GOLDMAN, a Member of the American Ornithologists' Union, died in Washington, D. C., September 2, 1946, at the age of seventy-three. He was born in Mount Carmel, Illinois, July 7, 1873, and at an early age moved to California where he was brought up on a ranch in the San Joaquin Valley near Alila, Tulare County. In 1891, he began to collect for the Biological Survey, and in January, 1892, as assistant to E. W. Nelson, he sailed from San Francisco for Colima, México. During the next fourteen years, he and Nelson traveled in all the states of México, including the peninsula of Lower California, and parts of Guatemala, collecting mammals, birds, and reptiles. In 1910, he made a biological survey of Panamá and the Canal Zone. During World War I, in 1918, he was appointed a major in the Sanitary Corps of the Army and spent several months in France directing activities in rodent control to protect food and army stores from destruction by rats. In later years, while making his headquarters in Washington, he was in charge of biological investigations from 1919 to 1925, and game reservations, and, at the time of his death, was preparing an account of the various places in México where he and Nelson had carried on field work. Altogether he was associated with the Biological Survey for nearly fifty-five years and had unusual experience in field, research, and administration work.

Goldman was elected an Associate of the Union in 1897 and a Member in 1902. He was also a member of the Cooper Ornithological Club, the American Association for the Advancement of Science, the American Society of Mammalogists, of which he was President at the time of his death, a member and past President of the Biological Society of Washington, and a member of the Washington Academy of Sciences. His publications were numerous. He prepared the Memorial of E. W. Nelson which appeared in 'The Auk' for 1935, but most of his contributions were based on the taxonomy of mammals. He specialized in certain groups of rodents, particularly the pocket mice and pocket gophers although two of his latest investigations dealt with coyotes and tropical American monkeys. Many mammals, birds, and plants were named in his honor, including *Goldmania*, a genus of hummingbirds based on a specimen which he collected in Panamá and which was described by Nelson in 1911.—T. S. PALMER.

EDWARD ROYAL WARREN, a Member of the American Ornithologists' Union, died at Colorado Springs, Colorado, April 20, 1942, at the age of eighty-two. Born in Waltham, Massachusetts, October 17, 1860, he was the son of Royal Sibley and Susan Elizabeth (Bates) Warren. He graduated from the Massachusetts Institute of Technology in 1881 and from Colorado College in 1883. From 1882 to 1896 he engaged in assaying, surveying, and mining engineering in Gunnison County and in Cripple Creek. From 1909 to 1918, he was Honorary Director of the Museum of Colorado College at Colorado Springs.

Warren was elected an Associate of the Union in 1902 and a Member in 1910. He was also a member of the Cooper Ornithological Club, the Wilson Ornithological Club, and the American Society of Mammalogists, and an Associate Member of the American Association for the Advancement of Science. While primarily a mammalogist, he also published a series of notes in 'The Auk,' 'Bird Lore,' and 'Condor' on the

distribution and occurrence of rare birds in Colorado. His principal publications included the 'Mammals of Colorado,' 1910, and 'The Beaver—Its Work and its Ways,' 1927. He also published on 'The Beaver in Yellowstone National Park' and 'Notes on the Beaver in Estes Park,' in the Roosevelt Wild Life Annals.

In 1916, he married Maude Smith of Colorado Springs by whom he had two daughters, Ruth Elizabeth and Margaret Bates Warren.—T. S. PALMER.

ERNEST KNAEBEL, an Honorary Life Associate of the American Ornithologists' Union, elected in 1906, died in West Boyford, Massachusetts, February 19, 1947, in his seventy-fifth year. He was the son of John H. and Susan Dikeman (Pray) Knaebel and was born at Manhasset, Long Island, N. Y., June 14, 1872. He graduated from Yale University in 1894, receiving his law degrees from his alma mater, L.L.B. in 1896, and L.L.M. in 1897. For some years he practiced law in New York City and then served as U. S. District Attorney in Denver, Colorado, from 1902 to 1907. In the latter year he was appointed a special assistant of the Attorney General and two years later organized the Public Lands Division of the Department of Justice and remained in charge of the division for seven years. He became Reporter of the Supreme Court of the United States October 31, 1916, and retained the position for nearly 28 years until ill health compelled his retirement in 1944. During his term as Reporter he edited 80 volumes of the U. S. Reports of the decisions of the Court.

While serving in the Department of Justice, Knaebel prepared an important brief on the authority of the President to withdraw public lands and establish national reservations. In the exercise of this authority, many National Bird Reservations and National Monuments were established. This authority was upheld by the Supreme Court in an important decision rendered about 1915 in the Mid-West Oil case.—T. S. PALMER.

AMELIA SANBORN ALLEN, wife of Professor James Turney Allen of the University of California, and an Associate of the American Ornithologists' Union, elected in 1919, died at the age of 70 in Berkeley, California, February 15, 1945. She was born in Winsor, Missouri, December 29, 1894, and came to California with her parents in 1888. After graduation from Pomona College at Claremont, California, she taught school for a while and married Professor Allen on January 4, 1899. In 1903 she became interested in birds and continued her activity for more than 40 years.

In 1911, the Allens took up their residence on the south side of Strawberry Canyon, adjoining the University campus. A feeding shelf was put up and banding operations begun which resulted in many observations of interest. These banding operations, dating from 1918, indicate that Mrs. Allen was one of the pioneer bird banders of California. In 1913 she was elected a member of the Cooper Ornithological Club and in 1916 Secretary of the Northern Division, an office which she filled for eight years. In 1936 she was elected President of the Northern Division, the first woman in the Club to hold this position. Three trips abroad in 1905-1906, 1924, and 1937 afforded opportunities for observations on Old World birds, especially on those of southern Europe. A more detailed account of Mrs. Allen's ornithological activities may be found in 'The Condor,' 47: 220-221, September, 1945.—T. S. PALMER.

JOHN ALDEN LORING, an Associate of the American Ornithologists' Union, died in Owego, Tioga County, New York, May 8, 1947, at the age of 76. He was born in Cleveland, Ohio, March 6, 1871, the son of Lieut. Benjamin William and Nellie Cahoon Loring and was educated at the Owego Free Academy, Owego, New York.

He was a field naturalist of the U. S. Biological Survey from 1892 to 1897 and curator of animals of the New York Zoological Park from 1897 to 1901. Later he was field naturalist for the U. S. National Museum, collecting mammals in Europe, and in 1909-1910 was a member of the Smithsonian Roosevelt Scientific Expedition to East Africa. In 1916 he went to South Africa to purchase wild animals for the zoological gardens of New York, Philadelphia, and Washington. During World War I he was a first lieutenant in the Ordnance Department of the army. He was unmarried.

Loring was elected an Associate of the A. O. U. in 1917 and retained his membership for nearly 30 years until his death, but apparently published only one brief note in 'The Auk.' This appeared in the volume for 1925 and recorded the occurrence of the Northern Raven in Tioga County, N. Y. He was author of 'Young Folks Nature Field Book,' 'African Adventure Stories,' and a number of articles on birds and mammals in 'Colliers' Weekly,' 'Metropolitan Magazine,' 'Outing,' and 'Youth's Companion.'

He was an active and energetic collector and during his European trip made a record by collecting 913 mammals and birds in 63 days. In recognition of his field activities his name is associated with the designations of several species including two birds from Africa, *Melittophagus variegatus loringi* and *Sarothrura elegans loringi*, a red-backed mouse from North Dakota, *Eutamias gapperi loringi*, and a pocket gopher from South Edmonton, Alberta, *Thomomys fuscus loringi*.—T. S. PALMER.

FREDERICK POMEROY PALEN.—Although more than thirteen years have passed since the death of F. P. Palen, a Life Associate of the American Ornithologists' Union, it seems desirable to place on record his connection with the Union, otherwise his name will remain merely an entry in the list of deceased members. Born in Jenningsville, Pennsylvania, April 20, 1872, the son of Peter E. and Rachel J. (Young) Palen, he graduated from Cornell University in 1894 with the degree of M.E. Soon after, he entered the employ of the Newport News Shipbuilding and Dry Dock Company. Beginning as a draftsman, he became successively Chief Engineer, 1906-1912, Assistant Manager, 1912-1915, and Vice-President from 1915 to 1929, when he resigned. In 1906, he married Lina Livingston Mayo of Richmond, Virginia, by whom he had a son, Frederick Pomeroy Palen.

He was elected a Life Associate of the Union in 1926 but did not have an opportunity to attend any of the meetings and died seven years later, December 2, 1933, at the age of sixty-one.—T. S. PALMER.

GOLDSBOROUGH SERPELL, a Life Associate of the American Ornithologists' Union, died in a hospital in Norfolk, Virginia, on April 29, 1946. The son of Goldsborough McDowell Serpell, civil engineer, railroad manager and lumber magnate, and Georgianna Clark Serpell, he was born at Connellsville, Pennsylvania, on July 15, 1875. Four sisters survive him. He was brought to Norfolk at the age of seven and spent the rest of his life in that city. He was educated at Norfolk Academy and the Virginia Military Institute, graduating at the latter institution in 1895. For a time thereafter he worked as civil engineer with the Atlantic Coast Line Railroad. In 1908 he became President of the Seaboard Bank, being made chairman of the board in 1917, and continuing in that position when the bank merged with the Citizens Bank to become the Seaboard Citizens National Bank.

A man of considerable wealth, he was active in business not only in Norfolk but also in wider circles, as a member of the boards of the Virginian Railway, the Chesapeake and Potomac Telephone Company, the Virginia Electric and Power Company, and other organizations. His public spirit led him to become interested in many

civic institutions, among them the Norfolk Museum of Arts and Sciences, the Community Fund, and the United War Fund. From 1932 he was an active member of the Board of Visitors of the Virginia Military Institute. He was a vestryman of St. Paul's Episcopal Church, Norfolk. On January 4, 1912, he married Susan Watkins, who lived only a year after the marriage.

Goldsborough Serpell was a prominent sportsman, duck hunter and golfer. His interest in ornithology was rather incidental to his love of the field. So far as I know, he wrote nothing on birds. Dignified and distinguished looking but always genial and genuinely democratic, he had many friends, and served well in his city and state.—J. J. MURRAY.

MRS. LOUIS ROBERTS TAYLOR, for nine years an Associate of the American Ornithologists' Union, was born in Milwaukee, Wisconsin, July 13, 1883, and died there March 14, 1944. She was a graduate of Milwaukee Downer Seminary; illness prevented further formal education. Having descended from a German family noted for its love of nature and the cultural arts, she inherited a distinctly artistic bent. She was an accomplished pianist, a skillful binder of books, and a worker in silver.

A determination to rear her son as close to nature as possible resulted in the purchase of an abandoned farm about eighteen miles north of Milwaukee. 'The Hummocks,' by judicious planting and studied provisions, became the resort of many species of song birds. She then became interested in birds of prey and the place became unique as a hospital for wounded raptors and other birds. This pursuit showed that she possessed a breadth of vision beyond that of the average student of birds.

The bronze plaque erected to the last Wisconsin Passenger Pigeon by the Wisconsin Society for Ornithology was donated by Mr. and Mrs. Taylor. It is particularly fitting that it was cast by the Loeffelholz Foundry, founded by her grandfather, Adam Loeffelholz, in 1848.—A. W. SCHORGER.

BIOGRAPHY IN THE AUK

A complete set of *The Auk* contains memorials and obituary notices of more than 700 former Fellows, Members, and Associates of the American Ornithologists' Union and also notices of a number of prominent ornithologists who were not members of the Union. If this material were all brought together in a 'Who Was Who in the A. O. U.,' it would fill nearly 1,000 pages, illustrated by 62 portraits, and would make the equivalent of two average-sized volumes of *The Auk*. About two-thirds of these notices were contributed by four members: 15, including 6 memorials, by A. K. Fisher, 76 by Witmer Stone, 133 by J. A. Allen, and about 260 by the writer.

Every effort is made to publish these notices as promptly as possible and occasionally they appear in the next number after the death of the subject, but announcements of death are often delayed and when received lack important data regarding place and exact date of death, birthplace, and activities. As a result, several years may intervene before the necessary facts are assembled. In one case, Charles Bill, the notice did not appear in *The Auk* for 44 years; in another, Gideon Mabbett, 51 years; and in a third, Samuel Wells Willard, 57 years after death.

Of the deceased members whose notices have not yet been published, less than half a dozen were Foreign Fellows, 7 were Fellows, 2 were Members, and the others, about 260, were Associates.—T. S. PALMER.

THE AUK

A Quarterly Journal of Ornithology

ORGAN OF THE AMERICAN ORNITHOLOGISTS' UNION

Manuscripts should be typewritten, double-spaced, if possible. Titles should be brief, within one printed line. Avoid footnotes. References to literature may be inserted in parentheses in the text or listed at the end of the paper; consult recent issues of 'The Auk' for the style of citation used. Long articles should have a brief summary at the end. Mark copy only for *italics*. Avoid Roman numerals and extensive or ruled tables. Line drawings should be in India ink on white paper or cardboard; if reduction will be necessary, details must be correspondingly bold. Captions should be brief; discussions belong in the text. Common and Latin names of North American birds should follow the A. O. U. Check-List except in taxonomic papers giving formal discussions of the changes. Except on request, no proofs of 'General Notes' or short communications will be sent to authors.

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All articles and communications intended for publication and all books and publications intended for review should be sent to the Editor.

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ATTENTION ALL MEMBERS

The Treasurer and Business Manager desires to thank those members who have returned their copies of *The Auk* for January, 1947. Their generosity has made possible the inclusion of this number in sets that would otherwise be incomplete.

The need for additional copies is still urgent so it is requested that any other members who do not intend to maintain a permanent file of *The Auk*, return their copies of the January number as soon as they are through with them.

FREDERICK C. LINCOLN
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